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## Table of Contents.

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ORIGINAL ARTICLES—	Page.	CURRENT COMMENT—	Page.
The Treatment of Psychoses and Psychoneuroses by Electropexy (Electric Shock Therapy) in a General Hospital, by John Bostock and Bertram J. Phillips .. . . .	1	Delay in the Diagnosis of Cancer .. . . .	18
Some Aspects of Female Infertility, by Lorna Lloyd-Green, M.B., B.S., D.G.O., M.R.C.O.G. . . . .	7	The Action of Folic Acid on Sulphonamide Blood Dyscrasias .. . . .	19
Abortive Syphilitic Aortitis, by Charles Engel, M.D. . . . .	12	Diphtheria Incidence in Relation to Age .. . . .	19
REPORTS OF CASES—		ABSTRACTS FROM MEDICAL LITERATURE—	
Blood Transfusion with Unsuspected Rh Sensitivity, by D. L. Davies, M.B., B.S. . . . .	13	Surgery .. . . .	20
Lieno-Renal Venous Anastomosis for Cirrhosis of the Liver and Ascites, by John Devine, M.S., F.R.C.S., F.R.A.C.S., F.A.C.S. . . . .	14	BIBLIOGRAPHY OF SCIENTIFIC AND INDUSTRIAL REPORTS—	
REVIEWS—		The Results of War-Time Research .. . . .	22
"Personal Mental Hygiene" .. . . .	16	BRITISH MEDICAL ASSOCIATION NEWS—	
"The Doctor's Job" .. . . .	16	Scientific .. . . .	24
NOTES ON BOOKS, CURRENT JOURNALS AND NEW APPLIANCES—		SPECIAL CORRESPONDENCE—	
A Medical Library Catalogue .. . . .	16	Paris Letter .. . . .	27
LEADING ARTICLES—		NOMINATIONS AND ELECTIONS .. . . .	28
A New Year's Resolution .. . . .	17	CORRIGENDUM .. . . .	28
		BOOKS RECEIVED .. . . .	28
		DIARY FOR THE MONTH .. . . .	28
		MEDICAL APPOINTMENTS: IMPORTANT NOTICE .. . . .	28
		EDITORIAL NOTICES .. . . .	28

### THE TREATMENT OF PSYCHOSES AND PSYCHONEUROSES BY ELECTROPLEXY (ELECTRIC SHOCK THERAPY) IN A GENERAL HOSPITAL.

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#### Introduction.

THE aim of the following investigation was the elucidation of the principles underlying electric convulsive therapy, its use in the psychoneuroses and psychoses, and its relationship to other psychiatric measures.

At the outset, it is opportune to make a strong protest against the use of the terms "shock" and "convulsive" as prefixes to "therapy". These words are far from reassuring to the patient and can be discarded with advantage. It is preferable to substitute the terms "electropexy" or even "electric treatment". They have been used in our wards and in private practice and lead to no confusion. It must be pointed out that, as minimal doses produce no convulsions yet have a definite therapeutic result, the term "convulsive" is a misnomer. The same argument applies to the treatment of curarized individuals.

The patients discussed in this paper were seen in the neuropsychiatric department of the Brisbane General Hospital. All were treated in an open ward. Patients considered suitable for an open ward were those suffering from neurasthenia, anxiety, hysteria, obsessions, and the milder manias, depressions, paraphrenias and schizophrénias. A patient's behaviour rather than his

psychiatric classification determined his transference to a closed ward or reception house.

In this paper a discussion of the investigation of 50 consecutive patients with anxiety and 50 consecutive patients with depression is given in detail as these two types make up the bulk of neuropsychiatric practice. Impressions on the use of electropexy in other psychiatric states are included.

#### Evaluation of Mental Illness.

Considerable difficulty is found in the classification of mental illness. The division between psychosis and psychoneurosis is often confusing. It is common to find elements of more than one classical clinical syndrome in any patient. For diagnostic classification the predominant trend is used as the chief criterion. In addition, other trends are employed in consideration of treatment. Thus if a patient is predominantly anxious and has hysterical tendencies, his condition will be classified as an anxiety state. As it is important to know if the response to treatment is altered by this complication it was specially recorded in the investigation.

A patient is commonly regarded as an organism reacting to environment. If this process is harmonious he is well adjusted. If it is not harmonious then he is maladjusted. The combination of conduct, speech, gesture *et cetera* is spoken of as "behaviour". This may be normal or so abnormal as to fall into the pattern of a mental illness (except in cases of brain injury or disease, which can also influence behaviour). Whether the person develops a mental illness or not largely depends on "personality".

Abnormal behaviour is more accurately written as a description than by using the conventional "tabloid" diagnostic pigeon-holes. Thus the description "psychoneurosis; anxiety state; severe; probable reaction to home environment; gradual onset; duration eighteen months; characterized by cardio-vascular phenomena, that is, palpitations and sweats and hysterical sensations such as feelings of weakness and falling" expresses much more than the

phrase "anxiety-state" or "anxiety neurosis". Similar diagnostic analyses were made on all patients of this series and formed the basis for our figures.

In dealing with psychoneurotic patients the amount of information which should be gleaned for accurate diagnosis and adequate treatment is very great. The family history, the physical state, the personality and the environment with its implications must be thoroughly assessed. It may be necessary to investigate the environment of early childhood. In this investigation we were helped by a trained psychologist and nursing staff. Their interviews with patients and relatives were invaluable. When further investigation was necessary, "Pentothal" analysis was used. Whilst no evaluation of this kind is perfect, such team investigation gives a fairly accurate idea of the main features of the illness.

#### The Use of Electroplexy in Diagnosis and Treatment.

Electric treatment can be used for diagnostic-curative purposes. Thus some patients after a few treatments revealed a fairly severe psychosis and were sent to the closed ward. This complication is due to the confusion produced by electroplexy which prevents the patient from concealing hallucinations or delusions. Similar results can be obtained with "Pentothal". Concealment of symptoms in individuals is often difficult to detect. The use of electroplexy in such cases may be helpful in diagnosis.

In the differentiating of organic from mental disorders electroplexy is often useful. One patient had an abdominal pain for which no cause could be found despite extensive laboratory and X-ray investigation. She was given a course of electroplexy but did not improve. At post-mortem examination a carcinoma of the colon was found. Another patient had an almost identical history but after a few treatments made a complete recovery. Her pain was purely of psychological origin.

If pain does not respond to electroplexy the search for an organic cause must be intensified. Such cases are not infrequent.

Electroplexy may be used as a diagnostic aid in distinguishing "hysterical turns" from true epileptic seizures. Epileptics develop convulsions on a lesser dose of electricity than hysterics, though this is not the experience of Pacella and Barrera.<sup>(1)</sup> Machines showing the "amps per second" reading are useful for accurate estimate of dosage. "Cardiazol" given subcutaneously in certain doses has been used for the same purpose by Goldstein and Weinberg.<sup>(2)</sup>

In our series electroplexy was used primarily as a method of treatment and not for diagnosis. The dosage for each patient was carefully considered, since indiscriminate treatment is often harmful. Due attention was paid to psychotherapy by suggestion, persuasion and reeducation.

#### Technique of Administration of Grand Mal Fits.

The "Ediswan" machine has been used throughout this investigation. Its output ranges to 150 volts and the current can be given from 0.05 second to 1.0 second. We have found that 140 volts for 0.3 second will produce a satisfactory grand mal reaction in most patients, even under sedation, and this dosage is used as a routine. If no convulsion occurs the time of administration is increased to 0.5 second. In an occasional patient it may be necessary to increase the time to 0.75 second. In non-epileptic patients given 140 volts for 0.1 second unless the dose is repeated at too short an interval there is the petit mal type of reaction in which the patient becomes unconscious but does not have a convulsion. This is of clinical use in certain physical conditions when a full convulsion is contraindicated.

As a rule no pre-administrative measures are used with electroplexy beyond ensuring that no treatment is given for at least an hour after a meal. Apprehensive or restless patients are given a mixture containing potassium bromide 30 grains, chloral hydrate 20 grains, and paraldehyde one drachm, one hour prior to treatment. Usually they are then asleep for the administration and sometimes are unaware that they have had treatment. Other

patients are given two drachms of paraldehyde immediately before treatment to allay restlessness in the post-convulsive confusional state. Although atropine, one one-hundredth of a grain, has been recommended before treatment to prevent excess of mucus in the respiratory passages, this method of premedication has not been considered necessary in this series.

False teeth, metal hair clips, wrist watches *et cetera* are removed. The patient lies upon a rubber mattress on a firm bed or table. The back is hyperextended over a low pillow. Legs are unrestricted except for a heavy blanket. A gag made of cotton-wool and gauze is placed in the patient's mouth to protect teeth and tongue. The skin is cleaned with a mixture of equal parts of spirit and saline solution, and the saline-soaked electrodes are placed over the frontal areas. This is the usual site selected, but temporal and parietal sites have been tried and our conclusions coincide with those of Gottesfeld, Tess and Herskovitz<sup>(3)</sup> that, whilst convulsions were easily induced by biparietal application, the frontal area is the most suitable. It is important that, before the current is administered and during the entire seizure, the patient's shoulders should be pressed firmly on the mattress. This is usually done by a wardman. The hands are held to the sides by one nurse, while another holds the patient's jaw, thus keeping the gag in place. With the use of this technique no fractures occurred.

After treatment the patients are returned to bed where they stay till awake. This may be from a few minutes to an hour or two. The standard routine for grand mal therapy is to give the treatments every day for three days and then every second day. In petit mal technique patients receive treatment daily until treatment ceases. Termination is determined partly by the progression of symptoms, partly by the onset and degree of confusion. Considerable experience is necessary to evaluate these.

#### Petit Mal Technique.

The technique for petit mal treatment is similar to that in the grand mal reaction. It is employed particularly for elderly and debilitated patients. With electric dosage of 140 volts for 0.1 second it is difficult to produce convulsions in a patient. When the current is administered the patient is seen to "jump" and then to lie back unconscious, usually holding his breath. When breathing returns to normal, the patient regains consciousness but is confused.

No further treatment is given until the corneal reflexes, light reflexes and breathing return to normal. Patients will often respond to a loud noise, indicating a return to consciousness. When the patient's eyes are open and staring as in the tonic stage of a grand mal reaction it is difficult to decide whether convulsions will occur or not. If a finger placed near the eye produces blinking it is usually safe to give another treatment. Should petit mal dosages be given at too short an interval, a seizure may occur. As the petit mal fits are being elicited the time of administration of the current can be gradually increased from 0.1 to 0.2 second with increasing severity of reactions. With more severe reactions the patient is less easily roused between fits. The ideal is to stop short of producing convulsions. As many as twelve petit mal convulsions have been induced one after the other, but six for one session are induced as a routine. Petit mal technique has been used safely on seriously ill patients.

#### Complications of Electroplexy.

With careful selection of patients and the use of the foregoing technique, serious complications are almost nonexistent. The chief contraindications are with cardiovascular disease. Deaths have been reported in patients with atheroma. On the other hand electroplexy was given successfully to a man who died from coronary occlusion some weeks later. At post-mortem examination his coronary artery was so atheromatous that a fine probe could hardly be passed along it.

Orthopaedic risks are obvious. Care must be taken with elderly patients particularly regarding the femur. The osteoporosis of bedridden patients is a contraindication.

*Fragilitas ossium* or Paget's disease may occasionally be encountered.

During the period of this survey (two years) only minor orthopaedic complications occurred though many hundreds of seizures were induced. It is a popular misconception based on early "Cardiazol" experience that fractures are common with electroplexy. They are so rare that the routine use of curare has not been considered.

Convulsions are less forceful if the patient is given a number of *petit mal* fits before the major reaction. After six *petit mal* reactions, and return to normal of pulse, respiration and colour, the convulsive dose is given. It usually takes 140 volts for 0.5 second or even longer to produce a convulsion in these circumstances.

In spite of the safety of electroplexy it must be conceded that, as with anaesthesia, there remains an element of risk of which the patient's relatives should be informed.

#### Age Range of Subjects Suitable for Electroplexy.

Electroplexy of the *petit mal* type can be given almost to anyone. This is illustrated by a woman of ninety-one years with one leg and cardiac failure who presented a behaviour problem at home. She developed unclean habits and refused to use a commode. Despite her eccentricities she was orientated and showed only slight confusion. After six treatments with *petit mal* fits (six per treatment) she became cooperative and cheerful.

At the other end of the age scale, a small boy of six years with an anxiety state ran away from school and home. Mere stay in hospital was useless. Improvement occurred after *grand mal* therapy. He was discharged to boarding school apparently perfectly well.

Such cases illustrate the wide range of age groups available for electroplexy. If the physical state of the patient prohibits the use of *grand mal* reaction then the *petit mal* type can be usefully employed.

#### Psychotherapy Used with Electroplexy.

Patients treated in a general hospital may be considered as living in a constant environment. Fortunately for purposes of comparison our patients were in the same ward. Male and female patients use a common dining room. They have the same recreational facilities under the supervision of the same nursing staff. An adjacent lawn gives opportunity for croquet and other organized ball games. Persuasion, suggestion and occupational therapy are given to all. None of the patients discussed in this paper had special psychological treatment.

The environment from which the patient came was carefully assessed and attempts were made to rectify injurious influences. If the environment could not be altered an attempt was made to give the patient sufficient insight to alter his own viewpoint. Often arrangements were made for the patient to make a temporary adjustment by a holiday.

Drugs were not given unless necessary. The patients were reminded that their illness was not physical and that little help could be expected from the medicine bottle. The placebo must never take the place of explanation. The giving of drugs to a psychiatric patient implies that the disease is organic and the explanation of the true origin of the symptoms thereby lacks conviction. It must, however, be admitted that this injunction cannot be obeyed too literally. As sleep and rest are important, paraldehyde two drachms or barbitone ten grains is given when necessary at bedtime. Vitamin B<sub>1</sub> tablets are given as a routine to increase the appetite. Most patients have anorexia before admission to hospital.

Patients are frequently tested in their home environment by going out for a few days on leave. This procedure is particularly useful when the bed position is pressing. Those who have a bad environment are better kept in hospital till well and then discharged on a long holiday without going near their home, thus avoiding old associations.

In-patient therapy is restricted by bed availability. Patients are usually discharged within one week of completion of electroplexy. Wherever necessary they are referred to the neuropsychiatric out-patient clinic for

further treatment. Here active psychotherapy is based on continued explanation and persuasion at the conscious level. It is pointed out that the nervous symptoms do not indicate disease but are a reaction to a way of life. The general hospital facilities for medical consultations and clinical tests are freely used for both their diagnostic and their reassurance values. Further attempts are made to adjust the patient's environment. While this is difficult and often impossible, results justify the utmost effort in this direction.

The problem of sedation in the out-patient department is important. It is pointed out repeatedly to the patients that their symptoms are not due to physical disease and therefore little help will come from medicines. They are encouraged to face their problems, help themselves and be educated in a new way of thinking. Often, however, they are so irritable and sleepless that sedation is necessary. *Mistura Gentianae Alkalina* with ten to 15 grains of sodium bromide, to be taken three times daily before meals, and barbitone tablets, five to ten grains at night, are commonly prescribed, but it is explained that the mixture is "just a tonic to make them eat" and that tablets are for sleeping and soon will no longer be necessary.

On the whole the above procedures work satisfactorily; most of the depressive subjects can be trusted with barbitone after they have had electroplexy. Our experience of attempted suicides is that they are usually untreated depressive subjects or hysterical subjects. The hysterical attempt at suicide is characteristically dramatic and half-hearted. In our opinion advantages of sedation for discharged patients far outweigh the risks of an occasional suicide.

#### A Comparison of the Therapeutic Value of Petit Mal Treatment with Grand Mal Treatment.

There is no doubt that the *petit mal* treatment has definite value, particularly for elderly depressives. Fifteen subjects of depression treated purely by *petit mal* technique were compared with 50 subjects of depression treated by *grand mal* technique only.

Of the depressive subjects treated by *petit mal* technique 47% were discharged fit for work, compared with 58% of those treated by *grand mal* technique. In view of the advanced age of the *petit mal* group (average age fifty-eight years), this result is surprisingly good. It was our impression that the patients receiving *petit mal* technique treatment needed many more sessions; but the figures show that those on the *grand mal* treatment needed on an average six treatments, whereas those on *petit mal* treatment needed eight sessions. Evidently *petit mal* treatment approaches *grand mal* in its therapeutic value.

#### Analysis of Case Material of Subjects of Anxiety States and Depressive States Treated with Electroplexy.

Fifty consecutive subjects of anxiety states and 50 consecutive subjects of depression were treated by electroplexy in an open ward of the Brisbane General Hospital under the conditions described above. They were all given *grand mal* treatments. It is interesting to see how closely the results in these two affective psychoneuroses correspond. No attempt was made to divide depressive states into reactive and cyclic types. Those occurring at the involutional period have the best prognosis. Results are shown in Table I. It will be noted that over 50% of patients were discharged from hospital fit for work.

For the others psychotherapy, supervision of rest, sedation and other measures were continued in the out-patient department. Many who were not quite well enough to work on discharge from hospital returned to their occupations after a month's holiday.

From six months to a year after discharge from hospital a follow-up investigation was made by circularizing all patients. Of the 50 subjects of anxiety states and 50 subjects of depressive states, 22 of the depressive subjects and 19 of those with anxiety states were traced. Among the 22 depressive subjects, 14 were well and working, 15 said that they had benefited, seven said that



TABLE I.

*Treatment of Fifty Subjects of Anxiety State and Fifty Subjects of Depressive State by Electroplexy. Figures refer to patient's condition on discharge from hospital.*

Type of State.	Grade of Recovery.				
	Excellent Results (No Residual Symptoms).	Fit for Work (but a Few Residual Symptoms).	Social Recovery (but not Well Enough to Work).	A Little Response.	No Response.
Anxiety states .. .. .	10%	42%	36%	8%	2%
Depressive states .. .. .	10%	48%	32%	10%	0

they had derived no benefit. Of the 19 patients with anxiety states, 13 were well and working, 14 claimed to have benefited, while five denied benefit.

Analysis of the patients who did not respond to treatment showed that they included individuals with poor personalities, others with unalterable adverse environments, and those who, having hysterical trends, were reluctant to part with a convenient illness.

#### *Response to Treatment of the Various Age Groups.*

During the period of this survey many young men were on active service. This may account for the 70% of female patients. Absence of this younger age group has an effect on the figures in Table II.

It will be noted that anxiety states occur earlier than depressive states. Whilst 66% of the anxiety states were in subjects younger than forty years of age, there were only 44% of depressive states among those of this age group.

The question of age of onset arises. In our opinion an anxiety reaction is usually a type of reaction to parents and environment of early childhood. In some cases an hereditary predisposition may be present. The clinical anxiety state in adult life may be regarded as an exacerbation of a pattern response laid down in early life.

Of the patients with depressive states 78% and of those with anxiety states 68% were married. As the patients treated are in age groups wherein marriage is the rule, the figures are of little significance.

The response to treatment of the anxiety states and depressive states bears little relation to age. The older patients (that is, the forty to sixty years age group) do better than the others.

Some of the elderly depressive subjects (over sixty years of age) did particularly well. The use of electroplexy in the aged, which was commenced as a timid experiment, has now progressed until age is no longer a barrier. Some of our best results are in old people. The experience of others confirms this. Mayer-Gross<sup>(1)</sup> treated a large series of elderly patients, many over seventy years of age, with considerable success.

Often it is difficult to separate organic from psychological factors in the illness. Often both are present. The aged brain, unable to adjust an aged person to his environment, makes use of psychopathological mechanisms for adaptation. Often electroplexy can be used as a diagnostic measure which results in cure.

#### *The Significance of a Previous Attack of Mental or Nervous Disease.*

By a coincidence 38% of patients with anxiety states and 38% of those with depressive states had had previous

attacks. This is apparently of no prognostic significance in anxiety states, since 45% of the patients with a history of a previous attack and 45% of those without such a history were discharged fit for work.

In the depressive states history of prior nervous and mental illness is important. Those without it responded better. Of those admitting a prior attack only 45% were discharged fit for work, against 60% of those who had had no such episode.

#### *The Significance of a Family History of Nervous or Mental Disease.*

The presence of a family history of mental or nervous disease is of some importance. It occurred in 30% of those with anxiety states and 26% of those with depressive states. Such histories as "parent was treated in a mental hospital", "mother has had a nervous breakdown", "brother was discharged from the army on account of his nerves", *et cetera*, were taken as evidence of familial mental or nervous disease. The relationship of a family history to the response to treatment is shown in Table III.

It will be seen that those without a family history of mental disease did considerably better, but this is not conclusive. It is possible that the environmental conditions are worse for those having an inherited taint.

#### *The Significance of Duration of Symptoms Before Treatment.*

The response to treatment of those patients with a long duration of symptoms before commencement of the illness was compared with results in illness of short duration. Among subjects of anxiety states of less than six months' duration the prognosis was good. Of these 65% were discharged fit for work, while only 40% of those whose symptoms were of more than six months' duration were able to work on leaving hospital.

Among those with depressive states the onset of symptoms was within six months in 70% of cases; of these 52% were fit for work on discharge. Only 40% with symptoms of over six months' duration were discharged well enough to work. This shows that the length of depression before treatment is not of such significance as the length of anxiety. An anxiety state of long duration is much less likely to respond adequately to treatment. The depressive tends to recover spontaneously. In anxiety states the anxiety reaction becomes a habit. Often it is based on a psychological conflict which cannot be removed.

#### *Personality Factors in the Psychoneurosis.*

The date of onset of a psychoneurotic illness is often difficult to decide. One cannot be sure whether the early stages of the illness or the "normal personality" is being

TABLE II.<sup>1</sup>

Type of State.	Age Group. (Years.)					
	10-20	21-30	31-40	41-50	51-60	61-70
Anxiety states .. .. .	4%	22%	40%	20%	14%	0%
Depressive states .. .. .	4%	18%	22%	28%	22%	6%

<sup>1</sup> Figures refer to percentage of cases falling in each age group.



described by the patient. The patient may admit that he has always been a "nervy type" or a "worrier" or "highly strung". The patient's relatives or friends may go further and say that he has always been "a neurotic" or was always a "bit queer", *et cetera*. In our series we elicited such a history in approximately 90% of those with anxiety states and in 90% of those with depressive states.

It was noted that those patients with the less marked psychoneurotic personalities have the best prognosis and that this is more marked in anxiety states. It was also noted that those with low intelligence quotients usually show little improvement with electroplexy.

TABLE III.<sup>1</sup>

Depressive States.		Anxiety States.	
Response Among Those with a Family History of Mental Disease.	Response Among Those without a Family History of Mental Disease.	Response Among Those with a Family History of Mental Disease.	Response Among Those without a Family History of Mental Disease.
45%	62%	33%	55%

<sup>1</sup> Percentage refers to number of patients fit for work on discharge from hospital.

#### *The Significance of Environmental Influences on Psychoneurotic Illness.*

In this series of 50 patients with anxiety and 50 with depressive states, 96% of those with anxiety states and 94% of those with the depressive states had environments sufficiently bad to be considered a factor in mental illness. This similarity is surprising. Attempts were invariably made to improve this, but with limited success. Usually one can only give advice. In spite of this over 50% of patients were discharged fit for work, and approximately 30% soon became well after further psychotherapy at the out-patient department. Apparently hospital treatment, away from the environment, together with electroplexy and psychotherapy, was sufficient to produce a satisfactory adjustment.

Some of the patients who recovered had to make difficult adjustments, as shown in the following figures. Among depressive subjects 44% of the 56% discharged fit for work had very adverse environments. Figures for those with anxiety states revealed that of the 52% discharged fit for work 40% had similar surroundings.

In some cases the environment was assessed very accurately, and it was possible to keep track of the patients under home conditions. Twelve with anxiety states and twelve with depressive states were in this category.

Of the twelve patients with anxiety states environment was adjusted for six, but that of the remainder could not be altered. Of the six with adjusted environments four were discharged fit for work (two without residual symptoms). Only one patient out of the unalterable six was fit to work on discharge. This result illustrates the importance of environmental factors in anxiety states.

In depressive states environment is of less importance. In the comparative series of twelve cases, of six patients with adjusted environments three were discharged fit for work; of the six with unadjusted environments, the "fit for work" ratio was identical. Although the number of cases is too small for accurate analysis it strongly suggests the importance of environmental adjustment.

A study of relapses gives a further perspective. During the period of this research, six anxiety and four depressive patients who relapsed were investigated. In each case we were unable to adjust environment. On the other hand there were many patients who did not relapse for whom nothing was done concerning the home environment.

#### *Relationship of Physical Factors to Psychoneurotic Illness.*

It should always be remembered that a neurotic patient can become physically ill. About 60% of the patients

treated in this series had some minor physical complaints, 10% had been subjected to multiple operations. Often the reason for surgical interference was obscure.

Physical factors can produce symptoms directly by interference with brain function or indirectly by psychological mechanisms. In the former must be included the following: nutritional and metabolic factors (blood sugar content variations, vitamin deficiency, poisons from tissue breakdown *et cetera*); cardio-vascular factors (producing fluctuation or cessation of blood supply to the brain or parts of it *et cetera*); hæmatopoietic factors (producing lower oxygen tension); toxic factors (exogenous factors such as alcohol, carbon monoxide, lead *et cetera*, and endogenous factors from toxic foci *et cetera*; factors producing brain damage (direct infection, various degenerations, trauma, tumours *et cetera*).

Physical factors producing indirectly a psychoneurotic disorder do so either through pain and discomfort or from a social complication. For example, a man breaks his leg, which causes much pain. Someone takes his job, he has financial difficulties and is in danger of the mortgage being closed on his house. Such a series of events can produce a psychological disorder in a susceptible individual. The number and variety of such vicious circles are legion.

There are, however, hundreds of patients in whom the physical factors listed above do not produce psychoneurotic disturbance. The hypothyroidism, the acute infection or the broken leg with financial complications which makes some patients acutely depressed does not affect others in identical circumstances.

This leads us to a conclusion that, in the main, only those with "psychoneurotic personalities" develop psychoneurotic disorders. It does not mean that the physical factors should not be adjusted. They should be dealt with as carefully as the environment, but not to the exclusion of electroplexy or psychotherapeutic measures where these are necessary.

#### *The Effect of Other Psychoneurotic Trends on the Recovery with Electroplexy.*

Of the series of patients with anxiety states 60% showed a mixed pattern of behaviour suggesting the existence of elements of another type of neurosis or psychosis. Such patients often have a worse prognosis, as only 33% of these were discharged fit for work compared with 52% in the total series. Of the depressive subjects 40% had similar mixed findings. About half of these were discharged fit for work, that is, about 10% less than in the total series of depressive subjects.

Hysterical, schizoid or paranoid trends in a patient offer a poor prognosis and it is our experience that the more marked their trends, the worse the prognosis.

#### *Prognostic Value of Rapidity of Response to Treatment.*

It is usually taken that the more rapid the improvement, the more hopeful the prognosis. Our experience is that this sign is not of much prognostic value. Neither does it follow that those with an initial improvement need fewer treatments.

In Table IV the response to treatment is classified in groups from +1 to +4, the optimum response being +4. Good recoveries and poor recoveries on an average follow the same number of treatments.

#### *Length of Period in Hospital for Both Types of Subject.*

Electroplexy has greatly diminished the duration of acute symptoms and period of stay in hospital is consequently considerably diminished. It does not follow that the time for complete recovery is diminished in the same ratio. While electroplexy undoubtedly creates a working basis for psychotherapy, the latter still entails lengthy reeducation and much perseverance. Table V shows the average stay in hospital for both types and the number of treatments necessary before discharge.

### *Electroplexy in Anxiety and Depression.*

In this investigation an attempt has been made to evaluate the factors concerned in treating anxiety and depressive states with electroplexy. It is concluded that this treatment is of considerable value, but should not be used unless coupled with psychotherapy and adjustment of the physical state.

Patients who have an adequate adjustable cause for their breakdown have a good prognosis. Those without family history of mental disease, with unblemished health record and a good personality, also do very well.

TABLE IV.  
*Showing Favourable Response and Number of Treatments.*

Type.	Average Number of Treatments for +4 Response.	Average Number of Treatments for +3 Response.	Average Number of Treatments for +2 Response.	Average Number of Treatments for +1 Response.
Depressive states	6	5	7	6
Anxiety states ..	6	5	6	5

The patients who do not improve have a well marked "psychoneurotic personality", often have a family history of mental disease and come from an environment which cannot be altered. Often they have "no adequate reason" for their breakdown.

As over 90% of our patients have a "psychoneurotic personality" and have been subject to psychological trauma, it can be argued that psychoneurotic patients are types who collapse mentally under environmental stresses. Probably the more marked the psychoneurotic personality, the less adverse factors are necessary to produce a collapse.

It might be argued that psychoneurotic personalities in this series would have improved with psychoanalysis by free association, but time, money, and opportunity make this form of treatment quite inaccessible to the average patient.

### *Electroplexy in Other Types of Mental Illness.*

#### *Hysteria.*

Electroplexy is of little value in hysteria *per se*, but is occasionally useful when the hysteria is accompanied by anxiety or depression. As a result of treatment headaches and amnesia are often added to the list of symptoms and eventually the patient is worse rather than better.

TABLE V.  
*Period in Hospital for Both Types.*

Type.	Average Number of Days in Hospital.	Average Number of Grand Mal Treatments.
Depressive states ..	21	6
Anxiety states .. ..	26	5 to 6

More success is obtained by the time-honoured but still modern method of explanation, suggestion and firm handling. When the diagnosis is certain an explanation of the mechanism is given to the patient and he is made to get up, walk or talk as the case may be. Firm handling, suggestive of bullying, may be necessary. The same result may sometimes be obtained with electroplexy, but it lacks the dramatic proof to the patient that there is no physical basis for his illness. Compromise with the patient by giving him "treatment" is a mistake as suggestion and explanation thereby lack conviction. Hysterical patients treated by electroplexy are more likely to relapse.

Intelligent patients can be treated by explanation and suggestion, but it is impossible to reason with the unintelligent and poorly disciplined types, particularly those

with psychopathic personalities. These patients often can be cured immediately by transferring them to a closed ward or reception house. One of us (B.J.P.) who has seen many such before and after transfer has noted many dramatic results. Apparently they find that illness becomes more unpleasant than the environment from which they were attempting to escape; a "cure" results. At this helpful stage of apperception explanation of the mechanism and adjustment of environment are opportune. Some patients are actually grateful for being "awakened up to themselves".

For these reasons hysteria should be treated by psychotherapy alone except in unusual circumstances.

#### *Obsessional States.*

Obsessional states are notoriously difficult to cure. Brain and Strauss<sup>6</sup> have justification for saying that the term "obsessional compulsive psychosis" is justified. Nevertheless, we have relieved many patients with this disorder.

Explanation, reassurance and careful adjustment of the environment are the main lines of attack. Electroplexy is of value and should be used so boldly that it produces confusion. Most patients with obsessional states have "scrupulous, over-anxious personalities". Confusion with loss of inhibition and self-criticism enables them to lose old behaviour patterns and cope with or even forget their obsessions.

Many with obsessional states are very intelligent people in highly skilled occupations. The economic situation must be examined before treatment with electroplexy, and time allowed for complete recovery from confusion before the patient returns to work.

Many poor results in the treatment of obsessional states are due to insufficient electroplexy or the too early return to an unfavourable environment, which reactivates the psychoneurosis.

#### *Schizophrenia.*

It is now generally agreed that insulin shock treatment for schizophrenia is superior to other methods of treatment. Brain and Strauss<sup>6</sup> in support of this quote the following experiment which was carried out in the New York State Hospital. Of 3000 patients with schizophrenia, 1000 were treated by insulin, 1000 were treated by convulsive therapy, and 1000 were left untreated as a control group. It was found that there was a higher remission rate in the control group than in those treated with convulsions, and that seven patients treated with insulin recovered for every one treated by convulsive therapy.

This finding does not mean that electroplexy is of no value in schizophrenia. Actually many patients respond well, although for others this treatment is useful only for acute symptoms, but these are often important. Thus katatonic subjects may be made to eat and rest; this is sometimes life-saving.

Many subjects of schizophrenia will ultimately settle down if the environment can be adjusted. Others, more severely affected, are doomed to stay in mental hospitals for the rest of their lives. Some make a suitable mental hospital adjustment, but not a social recovery. Any material alteration to the environment is often impossible, as it means a change of attitude of relatives and friends. It may depend on unalterable economic factors. In spite of difficulties it is important to adjust the environment if possible, as discharge to an unsuitable environment often precipitates a relapse.

Many criteria must be considered before a schizoid patient is treated with electroplexy. A family history of mental disturbance is an adverse factor. If the patient's normal personality is good the prognosis is more favourable. If the length of the illness before treatment is considerable the likelihood of responding rapidly to electroplexy is remote. An adequate cause for the illness is perhaps the most important factor. If the illness is of acute onset, of short duration, and precipitated by some severe psychological trauma, the treatment is well worth a trial. In many such cases of schizophrenia the patients have been treated by us with success.

Sometimes schizophrenia takes the form of periodic "outbursts" with a tendency for each attack to become less severe. Electroplexy is useful to shorten such episodes, or to enable the patient to be discharged to a suitable environment with cooperative relatives. The disease may ultimately settle down and patients may not need certification.

In this way electroplexy prevents the entrance of many schizophrenics into a mental hospital and delays the entrance of others. It might be argued, however, that as time is all important, they would have been better and perhaps more economically treated in a mental hospital.

#### Mania.

It is disappointing that, since patients suffering from mania cannot be treated in an open ward, it was not possible to collect a series to compare with that of depressive subjects. It is our impression that mania tends to settle down spontaneously and it is doubtful if electroplexy shortens the time of invalidity in the majority.

#### Paranoid States.

There has been no opportunity of treating a subject of paranoia with electroplexy. The response in paranoid types of schizophrenia has been mentioned. The results in paraphrenia are more favourable. Though some deteriorate, usually the delusions quickly disappear. The patient is well in a few weeks. Those with a marked emotional involvement have the best prognosis, for the intrinsic personality in paraphrenia, though of a delusional type, has resisted the injurious influences of the environment until middle age. This core of soundness is responsible for the improvement.

Experience shows that beneficial results with electroplexy are sometimes short lived. Many paraphrenic subjects after years or months return voluntarily for more treatment. This illustrates insight and the fact that electroplexy is not unpleasant. Other patients, however, after a few treatments become resentfully suspicious and refuse further treatment.

Senile delusional states are so often due to vascular disturbances of the brain that treatment by electroplexy is seldom of use.

#### Organic Reaction Types.

Electroplexy is useful in some organic conditions for its symptomatic results. For example, depression or anxiety in general paralysis may be relieved.

Successful reports of treatment in *paralysis agitans* and asthma have been published. From our own experience, the success is not imposing.

We have had some success with electroplexy in the treatment of drug addiction and alcoholism. When these conditions are symptoms of a psychoneurosis, such as anxiety state, the patient probably will be cured. In others, with habits dating back for years, benefit is less likely.

#### Use in Homosexuality.

Owensby<sup>(7)</sup> treated a series of homosexuals, both male and female, by convulsive treatment ("Metrazol") with considerable success. We have had but little experience in treating these patients by electroplexy, but the results have been encouraging. In conditioned types the prognosis is favourable, but in constitutional subjects there is but little hope.

#### Summary.

The general principles in treating mental illnesses with electroplexy are discussed and the technique of the treatment is described.

It has been found that electroplexy is of considerable use in depressive and anxiety states and of less use in other states. In some conditions it is useless. There is evidence to show that electroplexy should be used only in conjunction with psychotherapy.

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#### SOME ASPECTS OF FEMALE INFERTILITY.

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FEMALE INFERTILITY may be divided into two groups: (1) inability to initiate the reproductive process—the sterility group, and (2) inability to bring conception to fruition—the abortion and stillbirth group.

Sterility is an age-old problem, which until the last two decades was steeped in mystery, but recent advances in the physiology of the menstrual cycle and modern methods of diagnosis have done much to place its investigation on a rational basis. In the past the study of infertility suffered much from lack of coordination and organization. Most workers today consider that investigations should follow a set routine and do not agree with Wharton that this is unnecessary. Meaker has rightly stated that "there is more to the problem of sterility than potent males and patent tubes". The magnitude of the problem is indicated by Mander, who estimated that 20% of Australian marriages were childless. American and British figures are given as about 10%. Permanent childlessness is rarely deliberate. It should therefore be the aim of every gynaecologist to strive to lower this figure, as it is a matter of national as well as of individual importance.

Although this paper deals almost exclusively with female infertility, the importance of investigating both partners concurrently and completely cannot be over-emphasized. Many American gynaecologists refuse to investigate the wife if the husband will not cooperate. The problems are frequently multiple and no fault is too trivial to disregard. While this is often laborious and expensive for the patient, it will pay handsome dividends. The minimal diagnostic survey includes history taking and general physical and gynaecological examination, followed by more specialized investigations.

#### History.

Considerable time is taken to obtain a detailed and accurate history. Cary considers it the most important single step of the investigation. The patient should be made to feel that she has the confidence of the interrogator and she should not be hurried, otherwise important facts may be concealed and many intimate troubles not discussed. It is quite often during the history taking that one has the opportunity of teaching a little normal physiology and anatomy, knowledge of which is so often lacking.

The age of the patient is an important factor, for fertility generally falls with increasing years. The



greatest number of patients seeking advice fall in the age group of twenty-five to thirty-five years.

The duration of sterility is more important than the period of married life, especially as recently many couples have been separated for long periods of time owing to war service. The largest group of patients seen have been sterile for one to three years.

The relation of contraception to sterility is a matter of conjecture. Probably it plays a very small part. Various gynaecologists have warned of the effects of chemical contraceptives on the chemistry of the vagina, while others contend that *coitus interruptus* leads to pelvic congestion and resultant tubal obstruction. In a recent series of 368 patients, contraception was practised by 32.6% of private and 17.1% of hospital patients. In order to attack the problem from a different angle several hundred patients were interrogated during the ante-natal period. A large number had practised contraception, which quite frequently had been unsuccessful or had not appeared to inhibit conception when it was discontinued.

A history of past pregnancy is of importance, for tubal obstruction is the commonest cause of secondary sterility. Spontaneous abortion and childbirth, even if associated with an afebrile puerperium, may lead to subsequent sterility. Black-Schaffer recently investigated 67 patients and demonstrated subclinical salpingitis by microscopic section in 38%. In America insufflation during the puerperium is advocated in order to prevent tubal blockage.

The patient should be carefully questioned concerning her past health, as many illnesses may have a relevant bearing on her sterility. A patient who has suffered from tuberculous peritonitis would be suspected of genital tuberculosis, while a gonococcal infection may have resulted in tubal obstruction from acute salpingitis, although this is a less frequent cause of trouble than formerly. A history of appendicectomy for chronic pain in the right iliac fossa which is unrelieved by operation makes a diagnosis of tubo-ovarian disease presumptive. Acute appendicitis, especially with general peritonitis, may result in occlusion of the fimbriated ends of the tubes. Details of a previous abdominal operation should always be obtained if possible.

The age of the menarche should be elicited, because the sterility rate is high if menstruation begins after the age of seventeen years. Details of the menstrual flow should be obtained. It is amazing the number of patients who consider that they have a regular monthly cycle until advised to "keep a calendar". Amenorrhœa and hypomenorrhœa suggest endocrine dysfunction, while a history of intermenstrual discharge suggests factors which may prove inimical to the sperms. The presence of *Mittelschmerz* will assist in determining the time of ovulation.

A detailed sex history should be obtained. The frequency of intercourse is important, for some couples defeat their object by too frequent coitus which results in faulty spermatogenesis. Many concentrate on the days before and after menstruation under the impression that these times are the most fertile. Patients have been seen who douche for hygienic reasons immediately after coitus, little realizing that they are in virtue practising contraception. Dyspareunia will make one suspect the presence of local or psychological troubles. Lack of the orgasm, although a common complaint, is probably no higher in the infertile than the fertile group. It is doubtful if it plays any part in sterility.

The daily diet is discussed. It is considered that most Australians have an adequate protein intake, but many have an unbalanced diet lacking in vitamins, especially vitamin B.

#### Complete General Physical Examination.

The general physique of the patient may give a clue to the functioning of her endocrine system. Recently R. T. Frank has drawn attention to what he considers to be three stigmata of infertility: (i) nipples showing cup-shaped areola, (ii) sinistroposition of an anteverted uterus, (iii) congenital erosion of the cervix. By careful examination constitutional disorders and diseases will be discovered. In one instance a routine Wassermann test

yielded a positive result in 1.5% of hospital patients. This is a high figure, for Moore-White quotes none among 41 patients and Nicodemus one among 76 patients. The blood hæmoglobin estimation showed a large number to have a hæmoglobin value under 80%. The incidence of women with Rh-negative blood among those seeking advice for sterility is no higher than the normal incidence in the community. If a patient is obese and suggests the hypothyroid type, the basal metabolic rate should be estimated. Nicodemus considers that a subthyroid state exists if the basal metabolic rate is below zero and that this condition is often a cause of sterility. If pituitary dysfunction is suspected an X-ray examination of the *sella turcica* is undertaken.

#### Detailed Gynaecological Examination.

Gynaecological examination should include careful inspection and palpation of the pelvic organs. Routine urethral, cervical and vaginal swabs should be taken to exclude the presence of gonococcal, monilial or trichomonas infections. The last two are relatively common, while the first was discovered in only one patient of my series. Studdiford claims that many pregnancies follow the removal of trichomonas infections. In a series of fifty cases, a vaginal smear was taken and stained with Shorr's stain. While it was of help in confirming the effects of oestrogen therapy, it was considered to be a procedure which required much experience and could not be used for routine work.

The investigation of the vaginal pH has not been undertaken with much enthusiasm, for Greenhill contends that the sperm which fertilizes the ovum is probably one which is ejaculated at the cervix, and therefore is uninfluenced by vaginal secretions. Moench has disproved the old idea of the effect of vaginal acidity on sperms.

The presence of an intact hymen is a rarity; dyspareunia is more common and is often psychogenic in etiology.

This survey confirms the opinion of Bonney and Moore-White that the pin-hole os as a cause of sterility has been over-emphasized, for "if menstrual discharges can descend, surely a sperm can ascend". Cervical polypi are occasionally found, but much more common is the presence of cervical erosions. Many of these are of the superficial congenital type, while the grosser ones are often seen in association with a laceration. Hypoplasia of the uterus may be suspected on palpation and confirmed by estimation of the actual length of the uterus with a Meaker's sound. This condition is often associated with an acute anteverted position of the uterus. Myomata may be palpated and have some bearing on the problem, as 20% of patients with such tumours complain of sterility. Mobile retroversion is now rarely considered to be a factor in sterility. This is contrary to the ideas of twenty years ago when almost every "sterility" patient with a retroversion was subjected to operation. If the uterus is fixed, endometriosis should be suspected in a case of primary sterility.

Examination of the vaginal fornices may reveal adnexal abnormalities, including inflammation of the Fallopian tubes and ovarian cysts. Endometriosis is a very common cause of sterility. The differential diagnosis between chronic pelvic inflammation and endometriosis may often be difficult, but it may be assisted by a careful Rubin's test, for in the latter condition the tubes will invariably prove to be patent. I have, however, recently encountered two cases of endometriosis associated with bilateral hydrosalpinx.

At this stage it is most important to emphasize that any lesions found in the foregoing examination are first eradicated as far as is possible before further investigations are made.

The Fallopian tubes are then investigated for patency. This can be done either by transuterine insufflation with carbon dioxide according to Rubin's technique or by hysterosalpingography. These tests are not competitive, but should be complementary. Their therapeutic as well as diagnostic value is well known. Originally Rubin used oxygen, but carbon dioxide is now used as it is more soluble and more rapidly absorbed. Air should not be used,

because of the danger of air embolism. In all the reported fatalities air was used. This test should never be performed in the presence of any sign of genital tract infection or if there is any abnormal bleeding. The days between the second and eighth following the cessation of menstruation should always be chosen. This time is selected because, prior to the second day, there is danger of air embolism due to open venous sinuses and also the danger of regurgitation of menstrual fluid along the tubes with resultant pelvic endometriosis. After the eighth day a false reading may be obtained, due to the increased thickening of the uterine endometrium, and if the test is performed during the fertile period it may lessen the chances of immediate pregnancy. Sharman, however, carried out a series of investigations in which he compared kymograph tracings from the same patient at all phases of the cycle and he found an identical tracing at all times. In 1925 Rubin instituted the use of the kymograph and, as a result of this, information about tubal physiology is obtained, both patency and peristalsis being recorded. For the performance of a Rubin's test, the patient is placed in the lithotomy position. The external genitalia are swabbed with "Dettol" solution (one part in three) and a bivalve speculum is passed into the vagina which is then swabbed with "Dettol" solution (one part in three). A vulsellum is placed on the anterior lip of the cervix and the cervical canal is cleared of mucus by the use of cotton wool on a wooden applicator; then the canal is swabbed with pure "Dettol". An intrauterine cannula with a straight tip, a distal hole and an adjustable rubber acorn is used. Lateral holes in a cannula cause pain and a long curved cannula may perforate a small uterus. The cannula is connected by sterile rubber tubing to the cylinder of carbon dioxide. The rate of gas flow is set at 90 millilitres per minute and the apparatus is tested. The cannula is inserted into the cervical canal and pressed upwards, while a small amount of downward traction is exerted on the vulsellum, in order to secure a sealed system at the cervix. The mercury or kymograph tracing is rarely allowed to rise above 200 millimetres of mercury because of the danger of tubal rupture. Rubin warns of this, unless the abdomen is open. Petersen and Cron consider a pressure up to 300 millimetres is safe, as rupture always occurs through an avascular portion of the tube. Various results may be obtained. (i) A pressure sustained at 200 millimetres on repeated occasions suggests tubal blockage. (ii) A pressure rising to 100 millimetres and falling to about 40 millimetres indicates patency of one or both tubes. (iii) Various intermediate readings may be recorded, for example, a pressure of 170 millimetres which is sustained, suggests rigid tubes, partly patent. (iv) A pressure of 200 millimetres repeated several times and sustained, followed by a steady fall, suggests spasm. If the test suggests blockage the pressure should be raised four or five times, and on the last occasion the flow meter should be turned off and the cannula held firmly for two minutes, if possible. By this means, obstruction may at times be overcome. If the patient complains of lower mid-line pain, blockage or spasm at the cornual end of the tubes is indicated. If pain is felt in both iliac fossæ, fimbrial obstruction is suspected; while unilateral pain suggests obstruction of the fimbrial end of one tube. Results may be affected by irregular or too rapid introduction of gas. It is advisable to sit the patient up at the end of the test, and if 300 millilitres of gas have been introduced through patent tubes, she will complain of pain in either shoulder, due to subdiaphragmatic pneumoperitoneum. In contrast to Bellingham's views this has been found to be a most reliable confirmatory observation. Auscultation in the iliac fossæ is, however, a most fallacious method of confirming escape of gas from the fimbriated ends of the tubes, because gas can bubble through a hydrosalpinx, and it may be heard leaking from the cannula at the cervix. The habit of reporting the result of a Rubin's test as negative or positive is to be deprecated. From the foregoing remarks it will be realized that such a report is practically worthless. The main danger of this test is air embolism. Occasionally a patient may faint, but this is usually very transitory. Every

patient should remain in the recumbent position for at least half an hour after the test, and longer if shoulder pain returns on the assumption of the upright position. The kymograph has shown us that tubes thought to be satisfactorily patent may be rigid and not physiologically active, having no cilia and loss of peristalsis. Before one concludes that the tubes are blocked, the Rubin's test should be repeated or an X-ray examination performed. Norman Miller found 30% of patients with obstructed tubes. The figures in this series were 34% of private patients and 54% of hospital patients. Any method of performing a Rubin's test without volumetric and manometric control may be inaccurate and misleading.

If the tubes are not patent to carbon dioxide, hysterosalpingography is performed the following month, provided the patient suffers no ill effects from the Rubin's test. This has several advantages over the Rubin's test. Because oil is heavier and more viscous than gas, obstruction may be overcome and the tubes opened up. The site of any obstruction can be visualized by X-ray examination, the surgeon being thus assisted to plan a plastic operation. Gardner reserves the method entirely for prospective surgical cases. A higher percentage of pregnancies follows the injection of oil, but it should never replace the simpler and less costly Rubin's test, for pelvic inflammation and oil embolism are real dangers. One patient in this series of 368 patients developed pelvic cellulitis. The technique used is as follows. The patient is placed in the lithotomy position on the X-ray examination table under the fluorescent screen, and the technique is identical with that described for Rubin's test excepting that oil is injected instead of carbon dioxide. "Neo-hydriol" or "Iodatol" is used and not lipidol, which is too slowly absorbed and has irritant qualities leading to the formation of foreign body granulomata. The oil should be warm and introduced very slowly; the patient should, with very few exceptions, be conscious, so that, as soon as pain is experienced, the injection is ceased and is resumed only when she is comfortable. Only enough oil to maintain adequate filling of the uterus should be used and that will be found to be between six and ten millilitres as a rule. The practice of introducing twenty millilitres of oil into the uterus of an anesthetized patient is foolhardy. If the tubes are obstructed the venous plexuses are filled with oil and oil embolism results, whereas if the tubes are patent, unnecessary quantities of oil pass into the peritoneal cavity. The X-ray picture also shows the size of the uterus, any deformity, such as bicornuate uterus, and the presence of submucous polypi. False readings may result from cornual or fimbrial spasm. In the former the triangular region at the uterine cornual junction is rounded. In order to reduce this possibility to a minimum, all patients are given three grains of either "Seconal" or "Nembutal" prior to the performance of the test. If spasm is suggested by an X-ray examination, the procedure is repeated under anaesthesia with "Pentothal Sodium" administered intravenously. A film is taken while the patient is on the table and again twenty-four to forty-eight hours later, when a typical mosaic pattern indicates patency. Interpretation of the films is the most important and most difficult task of the investigation and needs the cooperation of an expert radiologist.

#### Investigation of Ovulation.

Our paucity of knowledge of ovulation is the central difficulty in the problem of sterility. Novak considers that a secretory endometrium is proof that ovulation has occurred. Endometrial biopsy may be performed several days prior to the onset of menstruation or within twelve hours after the onset. The former time may be chosen without fear of interrupting a pregnancy, as Lane-Roberts has shown that in such circumstances decidual formation is encouraged. The technique is as follows. The patient is placed in the left lateral position, and the cervix exposed by a Sims's speculum. The vagina and cervix are swabbed with "Dettol" solution (one in three), the anterior lip of the cervix is grasped with a vulsellum and the biopsy curette is introduced slowly and gently to the uterine fundus and then firmly drawn

down one of the uterine walls, removing a specimen of endometrium which is placed in formalin-saline solution and examined microscopically. Anovular menstruation is more frequent in women with irregular cycles than in those with regular periods. Grant quotes an incidence of 6%, Bellingham 5%, and Israel 15%. Anovular cycles may be occasional or habitual. *Metropathia hæmorrhagica* and tuberculous endometritis can also be diagnosed by this means. No cases were found in the present series. Sharman found 5% of cases of tuberculous endometritis in a series of 88 cases of sterility. An endometrial biopsy and Rubin's test should never be performed at the same time, because to be of diagnostic value they should be performed at different times in the cycle and, furthermore, the combination of the two procedures increases the risk of air embolism. Endometrial biopsy gives information concerning a single cycle only. For this reason basal temperature chart studies are of more value, as the time of ovulation can be easily followed in many cycles. Tompkins considers that rectal temperatures are better, but many workers have found oral readings quite satisfactory. The patient should be instructed to take the temperature in the morning, while still in bed, before eating or smoking, and to allow the thermometer to remain in the mouth for two minutes. A normal ovular cycle shows a typical biphasic curve. About fourteen days before the onset of menstruation a sudden fall in temperature occurs, followed by a considerable rise, which is continued throughout the progestational phase. If ovulation does not occur, the rise does not take place and a monophasic curve is found. The interval between ovulation and menstruation is fixed regardless of the length of the cycle. One cannot be certain whether ovulation actually occurs at the time of the fall in temperature or at the peak of the chart. Many workers believe the former, but it is hard to prove. Errors in the chart may be produced by intercurrent infections, while a twenty-four hour error may exist, if menstruation commences overnight. If pregnancy occurs the temperature remains elevated, and therefore basal temperature charts have been called "the poor-man's Friedman". Tompkins says pregnancy follows if coitus takes place within forty-eight hours of the temperature shift. Patterns are not always perfect, but the good patterns are more often found in people who are likely to conceive. After a time it is possible to obtain the necessary information from short graphs kept about the middle of the cycle only. Pregnanediol estimations have not been used in this group of cases. Differences in electric potential are too much affected by extraneous factors to be of value in timing ovulation.

#### Huhner's Test.

Huhner's test enables one to ascertain the reaction between the sperm and the female genital secretions. It should be performed one to two hours after coitus during the ovulation period, for it has been shown that the cervical mucus is a filter which is permeable to sperms at ovulation and menstruation only. It should be noted, however, that this test is of secondary importance to full seminal fluid examination, but it may demonstrate endocervical hostility. The technique is as follows. A dry bivalve speculum is passed and vaginal secretion is aspirated and examined microscopically. Normally many non-motile sperms are present. Then endocervical secretions are aspirated and there will normally be about five motile sperms per low power field. Walter Williams has investigated sperm motility, by taking samples from three levels—low cervix, high cervix and uterus. In the last, the sampling is a matter of chance. He considers the result positive if one sperm is found per high power field, but many workers contend that this figure is too low. This work has shown that alterations in the pH of the vaginal secretions are insufficient to affect sperm survival in the female genital tract. Further evidence of the capacity of sperms to penetrate may be obtained by the Miller-Kurzrok test, in which specimens of semen and cervical mucus are taken and placed side by side on a glass slide and the movements of the sperms observed.

#### Psychiatric Survey.

If the results of all the above investigations have proved satisfactory the possibility of a psychological factor is investigated. Kamman states that "there is enough in psychiatric literature to support the concept that there is such an entity as functional sterility". We have all met cases of long-standing sterility, in which pregnancy follows soon after adoption of a child or when financial security follows a period of depression.

The results of investigation into the aetiological factors of sterility suggest that much might be done to lower its incidence by such preventive measures as early treatment of adolescent hypoplasia and adequate sex education, the dangers of venereal disease and abortion being stressed. Most people are extremely ignorant about the human body and there is a great need for educational developments in this field. Diagnostic methods often result in therapeutic cures, therefore our diagnostic responsibilities are great. Unfortunately more accurate diagnosis has not been attended by comparable improvement in the results of treatment.

#### Treatment.

##### General Measures.

A diet with a high protein, high vitamin content is recommended and often vitamin E is added. If the patient is obese a reduction diet of 1200 Calories is given, while an undernourished person is placed on a diet with a high caloric value. Constipation is rectified by dietetic measures and exercise. Advice is given regarding the fertile period and the frequency of intercourse. It is often wise to restrict coitus to the twelfth, fourteenth, and sixteenth days before the onset of the next menstrual period. Septic foci are removed, special attention being paid to carious teeth and infected tonsils. Monilial and trichomonas infections of the vagina are treated and negative results from smears obtained before further investigation or treatment is proceeded with. In cases in which there is endocervicitis, this is best treated by fairly extensive diathermy, after dilatation of the cervix, and followed up by the weekly passage of dilators to prevent stenosis. Occasionally resistant conditions respond to sulphonamide therapy. Physiological douches, for example, with Ringer's glucose powder, put up commercially as "Nutri-sal", theoretically may be of value if the sperms are slightly sluggish.

##### Rubin's Test and Oil Injection.

Rubin's test and oil injection are the biggest single factors in treatment. If the tubes are not patent, oestradiol benzoate (50,000 benzoate units) is given by the intramuscular route every five days for five injections, accompanied by intrapelvic diathermy. Eight diathermy treatments are given, treatment being omitted during menstruation. These measures are followed by repeated insufflation. In this series a disappointingly small number of patients responded to this therapy. E. C. Hughes suggests that oestrogen acts by improving glycogen and enzyme production in the cells.

##### Surgical Measures.

All surgery should be as conservative as possible. In the past most patients underwent dilatation and curettage and a proportion became pregnant. This treatment may have acted by removal of a plug of mucus from the cervix or by reflexly stimulating the ovary. Ovarian cysts larger than 10 centimetres should be removed, if they are present on repeated examination. Much difficulty may be experienced in the removal of endometrial cysts, when one is endeavouring to conserve a small amount of normal ovarian tissue. Fibromyomata should be treated by myomectomy. While few have the patience of Bonney in removing 80 fibroid tumours from one patient, such conservatism is to be commended. Mobile retroversion should never be treated by operation. It may lower fertility by kinking the tubes, causing congestion of the tubes and uterus, causing prolapse of the ovaries and by altering the



position of the cervix and making it less accessible to the sperms. A Hodge pessary will keep the uterus anteverted and may be used if all other measures fail to produce a pregnancy. On the other hand, a fixed retroversion should be treated surgically. In the young sterile patient it is frequently associated with endometriosis and should be treated by removal of the cyst and the Crossen-Gilliam suspension operation. No patient should ever be subjected to the Alexander-Adams operation. Plastic operations on the tubes should rarely be undertaken and only if the abdomen is being opened for another reason. Greenhill is adamant on this point because the results of operation are so poor. Often the tubes are found to be patent after operation, but they are rigid non-functioning tubes. Peritonitis following salpingostomy is not unknown. It is wise to take pre-operative vaginal and cervical swabs and to give appropriate chemotherapy before and after operation. The use of amnioplastin to prevent further tubal adhesions, as suggested by overseas observers, has not been tried in this series. Tuffier's operation, in which the ovary is implanted in the endometrial cavity, may be tried as a last resort.

#### Hormone Therapy.

Hormone therapy, in general, is unsatisfactory. McLane considers that only 5% of anovular patients can be made to ovulate. The ideal therapy has not yet been discovered. Pregnant mare's serum ("Serogan") may be tried in doses of 100 units, intramuscular injections being given on three consecutive days, commencing on the ninth day of the cycle. With care it may be given by the intravenous route, but one should beware of serum anaphylaxis. Bullough considers that oestrogen should be given at the same time as it is necessary for ovulation. "Synapoidin", which is a mixture of chorionic gonadotropin and pituitary synergists, can be given in doses of 0.5 millilitre bi-weekly, until five injections are given, the course being repeated the following month with one millilitre doses. One patient in this series ovulated and conceived following this therapy. Patients with hypoplastic genitalia may be benefited by oestrogens, while thyroid may improve general metabolism and is often used rather empirically. Patients showing deficiency in the secretory phase, on endometrial biopsy, may be given progesterone, but large doses of 10 milligrammes daily are necessary during the second half of the cycle, and they are tedious and expensive for the patient.

#### Other Measures.

Deep X-ray therapy may be given to the pituitary and ovarian regions. While it is extensively used in America, the results of such therapy in this series have been disappointing. The transfusion of blood from a pregnant patient has been suggested, but it would appear easier to give chorionic gonadotropins from pregnancy urine. Adoption is a satisfactory substitute for motherhood in the majority of cases. Occasionally it fails, especially if congenital defects manifest themselves when the child has passed infancy. Ideally the baby should be taken by its foster parents when a few weeks old, so that they have an equal interest in its well-being and progress. It is necessary that the adoption should be legalized in order to avoid worry and heartache at any stage. It is important to warn prospective foster parents that they will be subject to cross-examination, by the Church body or home caring for the baby, as to suitability of character and home conditions, in the same way that they desire to select a suitable child. Insemination with the husband's semen is justifiable in cases of severe dyspareunia or impotence. The use of donor semen is to be condemned. It is not legal and there seems little difference between it and adultery. If the child is registered as the child of the husband, this is a false statement, and in any case the child is illegitimate. Many husbands consent because they think it may be in the best interests of the wife. This is often an immediate reaction to an unsatisfactory semen report, and their ideas may possibly change with time and more careful consideration. What of the child? Few people stop to consider the unfortunate offspring.

Leonard Parsons (1945) has stated an excellent case against artificial insemination. The status of artificial insemination has been described by Folsome as follows:

We, as physicians, will do well to devote greater energy to more fundamental research in human fertility. We may be rewarded with findings which may obviate the use of donor specimens except in the most remote instances. Our function to our sterile patients is more correctly prevention and reparation, not substitution and temporization.

#### Results of Treatment.

Meaker claims that 50% of his patients became pregnant. Such figures have usually been corrected to include only the group of people who should become pregnant. Bellingham claims 24% of pregnancies. In this series 39% of private patients and 18% of hospital patients became pregnant. The difference in results is probably due to the fact that a larger number of private patients completed their investigations. Krebs claims that, as in all things, prevention is better than cure, and that this can best be achieved by improving adolescent hygiene and by improved obstetric care. The spontaneous abortion rate is higher in the sterility group of patients. This may be due to faulty seed as well as to faulty soil and the sperm in these cases may be responsible and should be investigated. The incidence of ectopic pregnancy is also higher—1% to 2% as against 0.5%. It is likely to follow Rubin's test, especially where there is loss of tubal peristalsis.

#### Conclusion.

In conclusion it may be said that, while much has been learned concerning the problem of infertility over the past few years, our knowledge is still in its infancy. Advance will probably increase with knowledge of ovulation, on which much research is still required.

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### ABORTIVE SYPHILITIC AORTITIS.

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SYPHILITIC AORTITIS is generally a progressive disease. The pathological background is the formation of many inflammatory, in several places confluent, foci along the lymphatics of the *vasa vasorum* in the adventitia and then in the media, with areas of disseminated necrosis and destruction of muscular and elastic tissue in the media and consequent cicatrization. The typical fissures in the intima surface correspond to these scars. In course of time the foci multiply, an increasingly larger part of the aorta wall becomes involved, and in consequence the complications of aortitis set in. These are dilatation of the *aorta ascendens*, myocarditis following the progressive narrowing of the openings of the coronary arteries, incompetence of the semilunar valves and saccular aneurysms. Precise knowledge concerning these alterations was gained twenty-five to thirty years ago, at a time when this matter was of particular interest to pathologists. From the beginning, the prognosis has been regarded as grave. It was estimated that uncomplicated aortitis lasted three to three and a half years, and that aortitis with incompetence of the aorta or with myocarditis lasted for one to one and a half years. Thorough worldwide investigations, started at that time, disclosed that for a large number of patients with aortitis the prognosis was not so bad. More and more patients came under investigation at a time when treatment, especially with arsenical preparations, checked the progress of the disease.

The initial symptoms—lassitude, anaemia, retrosternal pain and respiratory troubles—were diminished or disappeared, and the patient remained in fairly good condition for years, sometimes for six, eight or even ten years, and could carry on a reasonably active life. Treatment obviously provoked cicatrization of the inflammatory foci, and what is perhaps even more important, hindered the formation of new foci. Careful observations revealed later that the disease remained unchanged in many cases for years, even if the patient did not undergo any specific treatment. The majority of these patients must have had that kind of aortitis which I term abortive (in the terminology of Stadler, rudimentary). In the recent notable book by Kampmeyer the term "active aortitis" is used, as is done by other authors too; the reverse of this condition would be called "inactive aortitis". I am sure that this term does not cover the same field as what I call "abortive aortitis". Inactive aortitis suggests a quiescence which may eventually turn into activity; the term "abortive" implies rather a finished course with healing, with unchanged clinical picture and with unchangeable pathological background, as we shall see further on.

On the basis of the latest investigations, we have to suppose that in every case of syphilis spirochaetes settle in the wall of the *aorta ascendens* and *arcus aortae*, as has been known for a long time in regard to the central nervous system. Naturally that does not mean that aortitis starts in every case, though Warthin (quoted by Boyd) is of the opinion that in every case of syphilis active lesions will be found in the aorta. However, if aortitis begins, it must begin very early, a short time after the infection. Specific inflammatory foci or even scattered scars in the media of the aorta can often be found in the first or second year after infection, or even sooner. However, symptoms generally appear much later, after ten or twenty years, when on the one hand the greater extension of the lesions and on the other hand the gradually developing fibrosis and sclerosis of the aorta or complicating hypertension make the latent disease manifest. Histological investigations reveal also that, though in some cases of aortitis the inflammatory alterations commence very early, this event takes place in but few foci and not extensively either in a longitudinal or in a transverse direction, and that scarring occurs without serious damage to the aorta wall. In these cases the microscope fails to confirm the typical picture of progressive aortitis with disseminated foci of necrosis in different stages and gross scarring with recent cell infiltration in the neighbourhood or farther away; it reveals only well demarcated scattered spotty scars without any collection of round cells. That is the histopathological background of aortitis which can be termed abortive.

In the pathology of syphilis we have many analogues for a similar condition, particularly in the pathology of *tuberc dorsalis*, clinically as much as histologically. For a long time has been known that form of *ataxia locomotrix* in which an examination performed for some other reason reveals abolition of one or both patellar and Achilles tendon reflexes, or failure in reaction of one or both pupils to light, the patient having made no complaints whatsoever about that condition, and what is even more significant, having failed to develop any new symptoms for years or decades, if at all. In this case there is a final cicatrization *in loco morbi*. That there are no fresh inflammatory changes either in the cord or in the posterior roots is confirmed by the examination of the cerebro-spinal fluid, which yields absolutely negative results. *Hepar lobatum syphiliticum* may also be such an anatomical condition of an abortive disease, multiple gummata having healed and left gross scars without the liver substance's having suffered partial or total alteration in a higher degree. It is certain that there is an analogous abortive alteration of the meninges too, by which the initially positive cerebro-spinal fluid findings become negative without clinical symptoms of disease having appeared. Naturally, an abortive course of aortitis is imaginable only in a case in which the specific lesion

occurs in the so-called dumb area of the *aorta ascendens*—that is, over the coronary artery openings.

It is possible that such a course of aortitis may be caused by energetic treatment carried out in the early secondary stage of syphilis (that is, treatment not yet directed against aortitis); but doubtless constitutional as well as conditional factors may also play a part. Abortive aortitis seems to have been observed rather in the asthenic type of patient; the predisposition towards aortitis in the pycnotic habitus is well known, and in this type of patient abortive aortitis occurs less frequently.

The following is the clinical picture of abortive aortitis. It occurs in relatively young persons—that is, mostly between the ages of thirty and forty years or somewhat older. The clinical findings are slight dilatation of the aorta, a hardly perceptible soft systolic aortic murmur and a metallic second sound; subjective symptoms are lacking and there is no history of previous rheumatic fever, but there is evidence of syphilis in the past, and the findings remain unchanged for many years without specific treatment. The blood test generally gives negative results (it gives a positive result in about 70% of other cases of aortitis), but the result may be positive; in the latter case the focus of the spirochaetes must be supposed to be located in another site in the body and not in the aorta, as is general in latent late syphilis when blood tests produce a positive result. In my wards and out-patient department of the Apponyi Polyclinic in Budapest, we were able to observe such patients for many years. They presented themselves regularly with a cough, with some gastric upset or with symptoms of another disease; but the state of the aorta remained unchanged without any specific treatment. Such cases are of great practical importance. These patients should not be subjected to any specific treatment, as in the aorta there are no active foci of syphilis which may still be influenced by the treatment.

It would therefore seem important to be able to establish the diagnosis of abortive aortitis by clinical investigation. At present, however, this is not possible. Some authors express the opinion that patients with aortitis whose blood yields negative results on being tested, and whose red blood cell sedimentation rate is normal, should be considered as having evidence of inactive aortitis; I myself would in addition suggest abortive aortitis. I could not confirm this by investigations made on my patients. I found an increased sedimentation rate on examining the blood of patients with unchanged aortic findings for many years, and a normal sedimentation rate in the blood of patients whose deterioration was rather rapid. Counting of white blood cells and investigation of their type, the Noguchi luetin reaction, the almost forgotten gutta-diaphot test—all were of no value at all. I have followed these cases with keen interest during the past fifteen years, and I have found that the diagnosis of abortive aortitis can only be established by careful clinical observation during many years, and that at present there are no methods by which one may separate the patients with aortitis who need treatment from those for whom it may be omitted. At present all patients with aortitis should be treated as soon as the diagnosis is established.

The question is whether abortive aortitis occurs frequently. The answer is in the affirmative. It is well known that uncomplicated aortitis is often completely symptomless. In the statistics of many authors who traced the clinical records of syphilitics in the post-mortem room when the autopsy revealed aortitis, in more than half of the cases no symptoms of this disease were encountered during life. It is probable that among these cases there must have been a fair number of the abortive kind, though it must be pointed out that lack of symptoms cannot be regarded as evidence of abortive aortitis; many a patient dies suddenly in consequence of aortitis who showed no previous sign of it.

It is interesting and at the same time important to note that aortitis with a rather benign course was often observed in patients suffering from dementia of the insane, or from tabes. This observation aroused the

attention of the Austrian authors Frisch and Kessler more than fifteen years ago. Prior to that, Wagner-Jauregg mentioned that he very seldom saw his paralytic patients die from heart failure. Noteworthy from this standpoint are the investigations of Scherer, who found scarring of a minor or major degree in the aorta of some paralytics without signs of recent inflammation. This must be the explanation of the interesting and important observation that the majority of paralytics endure malaria treatment so well, although it is well known that syphilitics are specially sensitive to infectious diseases. When influenza terribly ravaged syphilitics in the years 1918-1919, the cause must have been principally aortitis.

Exceptionally it happens in cases of syphilitic aortic incompetence that the disease proves to be of abortive type. I possess records of three men with aortic incompetence of syphilitic origin (proved at autopsy) who had no complaints concerning this lesion during ten years' observation, whose electrocardiogram remained well within the normal limits for all that time, and who died of intercurrent diseases (one of them of cancer of the stomach, for which he underwent surgical intervention with uneventful post-operative history). I also remember a paralytic whose small aneurysm I controlled for more than fifteen years and who died from influenza pneumonia. In the case of an electrocardiogram with evidence of myocarditis, there is naturally hardly any hope that the aortitis may be abortive.

Treatment of aortitis is in many cases, especially when evidence is poor, more or less schematic. After several courses treatment may have to be discontinued. Disappearance of objective symptoms cannot, of course, be expected. That being so, I have decided to stop the treatment proportionally earlier if hope is justified that the disease may be of the abortive type.

#### Acknowledgement.

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## Reports of Cases.

### BLOOD TRANSFUSION WITH UNSUSPECTED RH SENSITIVITY.

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#### Clinical Record.

A MALE patient, aged thirty-one years, was admitted to the Repatriation General Hospital, Springbank, South Australia, in June, 1947, and gave the following history. In October, 1945, he had vomited about one pint of altered blood, and his stools were tarry for two days; his condition was investigated, but no evidence of peptic ulcer was found. Subsequently he had periodical attacks of epigastric pain, particularly after the evening meal; he had not dieted or taken alkaline powders. One month



prior to his admission to hospital he awoke one night feeling nauseated, but did not vomit; melena was present during the next two days. Two days before his admission to hospital he had vomited a large quantity of bright blood, and later some altered blood; his stools had been black since then. On the day of his admission to hospital he again vomited a large quantity of bright blood.

On examination, the patient was pale, with a cold, clammy skin. His blood pressure was 130 millimetres of mercury, systolic, and 90 millimetres, diastolic. His temperature was 98° F., his pulse rate was 100 per minute and his respirations numbered 22 per minute. The hæmoglobin value was 52%.

The following morning his general condition had improved a little, and there were no signs or symptoms of continued hæmorrhage. In view of the patient's general condition and lowered hæmoglobin value, a blood transfusion was considered necessary. He had not before received a blood transfusion. The patient's blood group was O (IV), and by direct matching for twenty minutes at room temperature his serum was found to be compatible with the red cells of four donors of group O (IV). Four pints of blood were given over a period of twenty-four hours without any reaction, and his general condition improved.

Twenty-four hours after cessation of the transfusion he was slightly jaundiced. Twenty-four hours later again he was deeply jaundiced, but felt well; the hæmoglobin value was then 60%. His urine was chocolate coloured and turbid, and contained much bilirubin and methæmalbumin. Examination of his blood revealed gross hæmolysis.

Treatment with normal saline solution, 4% dextrose in normal saline solution and sodium lactate was commenced by the intravenous drip method. In addition, 80 millilitres of 10% magnesium sulphate solution were injected through the drip apparatus to prevent deposition of acid hæmatin in the glomeruli.

Investigations were carried out to discover the explanation of the hæmolysis. In the first place, the patient, on being further questioned, said that at a malaria experimental station at Rocky River in January, 1944, he had received 20 millilitres of malarial blood by intramuscular injection. Next, blood and serum taken from the patient during the stage of intense jaundice were sent to the Institute of Medical and Veterinary Science, Adelaide, for examination. The patient's blood was there found to belong to group O(IV) and to be Rh-negative. The following findings were obtained on examination of the serum. The anti-A agglutinin titre was 1/16 (++), 1/32 (+), 1/64 (+). The anti-B agglutinin titre was 1/16 (++), 1/32 (+), 1/64 (+). Anti-Rh agglutinins were present to a titre of 1/16. The conglutination test revealed that clumping was present to a titre of 1/8. The serum agglutinated the red cells of all four donors and of six other Rh-positive specimens of blood at room temperature. There was no clumping of Rh-negative red cells. The serum of the four donors did not agglutinate the red cells of the patient. Fortunately serum taken from the patient before the blood transfusion was still available, and this was also sent to the institute for checking. The findings were as follows. Anti-Rh agglutinins were present to a titre of 1/32 (++), 1/64 (+), 1/128 (+). By direct matching the serum was compatible with the red cells of the four donors of blood group O(IV) at room temperature for thirty minutes. At 37° C. the cells of the donors were agglutinated. The titre was 1 (+).

#### Conclusions.

The patient was apparently made sensitive to Rh-positive blood by the intramuscular injection of 20 millilitres of blood in January, 1944, there being no history of previous blood therapy.

Although our tests, later confirmed by the Institute of Medical and Veterinary Science, Adelaide, showed that the patient's serum and the donors' cells were compatible at room temperature for twenty minutes, the transfusion subjected him to a grave risk.

This case raises the point that, for the absolute safety of the patient, either one of the following two precautions should be taken if there is a history of previous blood transfusion or intramuscular injection of blood. (i) Their blood should be tested for the Rh factor, and if it is Rh-negative, they should be given Rh-negative blood. (ii) The cells of the donor's blood and the patient's serum should be incubated at 37° C. for twenty minutes before being pronounced compatible. The latter procedure, being the more practicable, is to be used at the hospital in all future cases in which there is a previous history of any blood therapy.

Fortunately the patient made a good recovery. No abnormality was found to explain his hæmatemesis.

#### Acknowledgements.

I am indebted to the Chairman of the Repatriation Commission for permission to publish this case, and to the medical superintendent (Dr. A. B. Anderson) and the medical consultant (Dr. G. A. Lendon) of the Repatriation General Hospital, Springbank, for assistance in the preparation of these notes and in the treatment of the patient.

#### LIENO-RENAL VENOUS ANASTOMOSIS FOR CIRRHOSIS OF THE LIVER AND ASCITES.<sup>1</sup>

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A WOMAN, aged thirty-four years, in 1943 suffered from burning pain in the right hypochondrium. The pain continued for a week and gradually subsided. At this

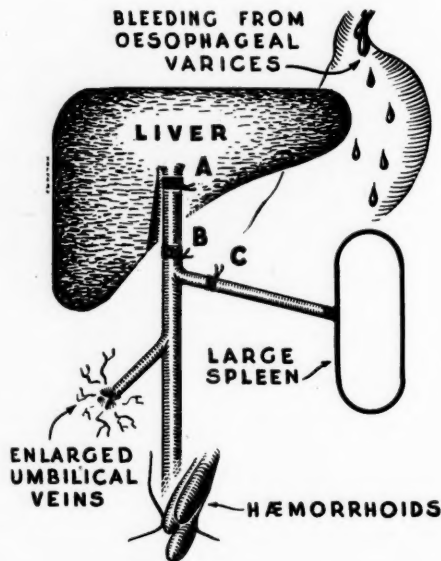


FIGURE I.

stage she is said to have had a right pleural effusion. She had had ascites for three years. The abdomen had to be

<sup>1</sup>This patient was shown at a meeting of the Victorian Branch of the British Medical Association on May 21, 1947, at the Alfred Hospital.

tapped and fluid removed at increasingly short intervals, so that, prior to her operation in March, 1947, it filled within a week of each aspiration and had to be tapped within five weeks. It was estimated that five and a half gallons of fluid were removed at one aspiration. Within the year prior to her operation a large umbilical hernia had developed. She was able to walk around the street without growing tired and without shortness of breath, and could sleep flat on her bed; her feet swelled only at the end of a long day, and then only mildly. She gave no history of rheumatic fever. The heart sounds were regular and clear. The apex beat was four inches from the middle line, and fluoroscopic examination of the heart revealed "flutter" pulsation of its left border. The abdomen was very distended, a large umbilical hernia was present, and

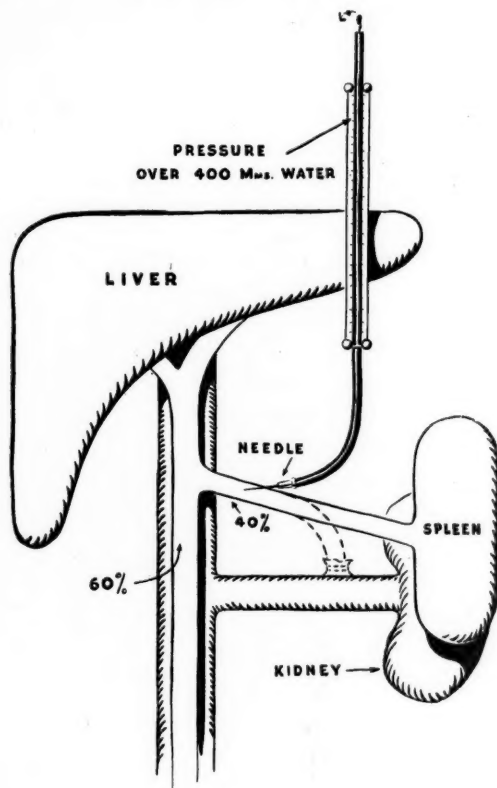


FIGURE II.

distended veins in the abdominal wall and fullness of the veins of the neck were detected. Pelvic examination, carried out to exclude Meig's syndrome (ovarian tumour with ascites and hydrothorax), revealed no abnormality. Examination of the systemic and portal venous junctions revealed slightly congested haemorrhoids and a few abdominal veins. X-ray examination of the oesophagus with a "barium smear" revealed no varices at its lower end. The venous pressure estimated on three occasions at atrial level in the cubital vein was less than an inch of citrate solution, and a similar low pressure was recorded in the neck.

It was considered that the patient's ascites was out of all proportion to her cardiac symptoms and signs, and that a difference in the systemic and portal pressures would seem to be indicated by the presence of veins on the abdomen, by the haemorrhoids and by the ascites. However, there was (and still is) some doubt whether she was also suffering from constrictive pericarditis.

On March 28, 1947, the abdomen was opened through a left Kocher incision. Examination of the liver revealed fine cirrhosis; no tumours of the ovaries were found. A manometer filled with citrate solution was connected to a hypodermic needle, which was introduced into the splenic vein. The fluid rose to the full length of the manometer (400 millimetres of water) and it then overflowed; the pressure was thus over 400 millimetres of water, as against a normal figure of 80 to 90 millimetres. The spleen was then removed (it weighed 230 grammes when emptied of blood), and the splenic vein was anastomosed to the side of the left renal vein by means of a vitallium tube four millimetres in diameter, after the method of Blakemore.

The duration of the operation was five hours. Convalescence was uneventful. Since the operation the patient's abdomen has gradually filled up again, though much more slowly than previously (it has gone for twenty-four weeks without being tapped); her complexion has become clear instead of yellow, and her general outlook

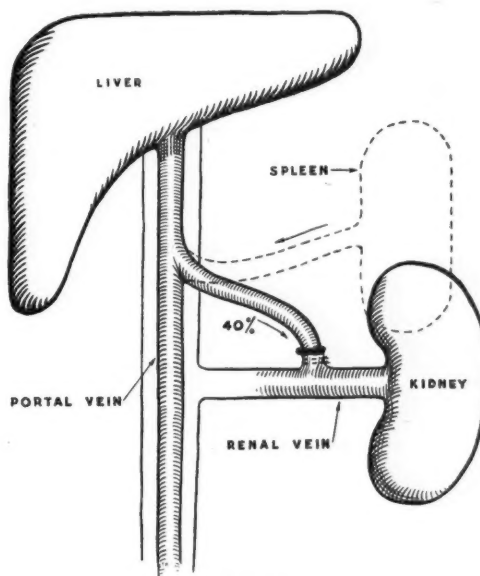


FIGURE III.

and condition are much improved. In the literature it is reported that the abdomen must be tapped once or twice after operation as a routine measure, even though the ascites completely clears up.

#### Discussion.

This patient, suffering from cirrhosis of the liver and portal hypertension, has been treated by a lieno-renal venous shunt, 40% of the portal blood being thus shunted. The full results of the procedure are still in doubt, though improvement is undoubted. Some months must elapse before it will be known whether the ascites will disappear, as apparently in most cases the abdomen "fills up" several times after operation. However, it is considered (with "hind sight") that in this case, because of the huge difference in venous pressures, and because the splenic vein was only wide enough to allow of the use of a four millimetre tube (seven millimetres is the size generally used), a shunting of 100% of the blood from the portal vein into the inferior vena cava might well have been carried out, and may yet be required. That procedure is technically easier, but, of course, it brings about a more sudden change in the blood supply to the liver. Shunts between the portal and venous systems are indicated in cases of portal hypertension, as is found in cases of Banti's disease associated with gastro-intestinal haemorrhage, and in some cases of cirrhosis of the liver with ascites.

## Reviews.

### "PERSONAL MENTAL HYGIENE."

DOM THOMAS VERNER MOORE, the author of "Personal Mental Hygiene", essays therein to point out the necessity for the adoption of ideals and principles as a means of maintaining mental health.<sup>1</sup> The book comes from the Catholic University of America, and therefore the ideals and principles advocated are those accepted by that faith. Nevertheless most of the principles set forth would be generally approved—in fact, they are actually a presentation of accepted Christian ethics, and as such are desirable from a social and moral aspect. Whether their reiteration in a book such as this is likely to prevent mental ill health in any way is open to question. The principles are familiar to all with a Christian training, and, as the author states, "if a patient has no religious convictions, he cannot be aided by religious concepts"; the non-religious are not likely to be assisted.

The book is curiously uneven. The author is at his best when dealing with child guidance, a section rather free from the didactic atmosphere of the remainder of the book. There are two excellent chapters, unfortunately short, on "The Over-Protected Child" and "The Rejected Child".

The most attractive portion of the book—although it is doubtful whether it has any proper place in the promoting of mental hygiene—includes an interesting dissertation upon the lives and poetry of Dante, Rossetti, Swinburne, Francis Thompson and Joyce Kilmer. Unfortunately the graphic description of Swinburne's sadism, with the over-emphasized extracts from his poems—they take on added emphasis when removed from their context—is in danger of arousing the reverse effect from that intended by the author.

The book is written for the layman, but in its scholarly aloofness, it cannot fail to be caviare to the general public. Among any but those whose religious beliefs agree with those of the author, his ex-cathedra statements will cause irritation and antagonism. Those sufferers from mental ill health who seek assistance from the book will meet the rather sterile concept: "Be good and you will be well." On the other hand readers who look for guidance in the application of Christian ethics in their personal and social contacts, and in the needs of the nation, will find much that is thoughtfully stimulating.

### "THE DOCTOR'S JOB."

MANY a medical practitioner with long and varied experience, a sage and cultured mind, shrewd judgement, a genial disposition and a facile pen could write a book similar to "The Doctor's Job",<sup>2</sup> but few make the attempt. The author, Dr. Carl Binger, is an American, and he has followed the tradition of Osler with a little of the philosopher William James thrown in. Being a good American, he takes care that his countrymen do not miss any priority honours, and so we need not be surprised at the following sentence: "That insect carriers could transmit disease had been first demonstrated in 1893 by Theobald Smith, one of the most illustrious figures in American medical history." The book covers a wide domain and deals with modern discoveries; the possible developments of medicine; psychiatry and medicine; the social and political aspects of medical practice and the relation of doctor to patient. Perhaps the most important part of the book is the author's eloquent plea for more attention to be paid to the patient's state of mind. He claims that diseases resulting from emotional causes are on the increase and so demand more study than ever before. Though brought up in the older traditions of medicine he is a firm believer in psychotherapy when it is in competent hands and it is refreshing to find that he keeps clear of that obsession with sex which has brought so much psychoanalytical work into disrepute. He condemns the surgeon who makes a hurried visit to his ward patient, glances at the wound, beams with pleasure at its healthy appearance and then leaves, but does not know that the patient had a bad night with flatulence, has aching joints which make him seek one position after another for

comfort, that the nurses wake the ward inmates at an unnecessarily early hour and with much clatter and often want to talk politics when the patient's main desire is to be left in peace. Has anyone, he asks, ever said that the food in hospital is delicious? There should be more sympathetic handling of convalescence and always a kindly investigation into the patient's domestic life. Perhaps the chief message of the book can be found summarized in the following short paragraph:

The essence of good medical care depends, in my opinion, upon a closer relationship between the patient and a doctor with a healing personality, one who cares about helping him and who has at his disposal all the technical facilities of twentieth-century medicine. Neither by itself is sufficient. Only a combination of the two will produce the desired results.

Of particular interest to Australians at the present time is the chapter on socialized medicine. The Wagner-Murray-Dingell bill brought before Congress proposed "to include practically the entire population, regardless of income, for all the major items of medical expense except dentistry, drugs and home nursing. Medical service is to be paid for by payroll deductions of 3 per cent. and employer contributions of a like amount on wages or salaries up to three thousand dollars". This bill has been opposed by the American Medical Association:

... which holds that the only place for government interference is in matters concerning the general public health, the control of communicable diseases, the care of the tuberculous, of the chronically ill, of sufferers from nervous and mental diseases, of war veterans and of the indigent who cannot employ their own physicians. In other words organized medicine says socialization shall go no further than it already has, and organized labor says it shall. ... Many doctors feel that their freedom would be seriously jeopardized and their status diminished and that medical care would deteriorate.

The author does not take his stand under either banner and gives his conclusions as follows:

I should like to state right now that no system of easier and less painful payments, no act of Congress, will in itself insure good medical care, which must depend upon good doctors and enough of them and upon good hospitals and enough of them also. ... The paradox of the situation is that doctors are busying themselves with the actuarial minutiae, and sociologists, statisticians, politicians and government officials are busying themselves with details of medical care. Perhaps we will make steadier and more rapid progress when the experts begin to co-operate, each staying in his own field.

Something of the same criticism can occasionally be applied to Australian conditions. This publication may be described as a bedside book for doctors who will read with pleasure and no doubt some spiritual satisfaction the astute comments of a colleague gifted with abundant common sense and a capacity to write attractively.

## Notes on Books, Current Journals and New Appliances.

### A MEDICAL LIBRARY CATALOGUE.

THE publishing house of H. K. Lewis and Company, of 136, Gower Street, London, issues a catalogue for its medical, scientific and lending library. The last catalogue was published in 1944 and dealt with the library as it was at the end of 1943. A supplement covering the years 1944-1946 has now appeared.<sup>1</sup> Lewis's lending library is of great use to practitioners in the Old Country, who may borrow up to thirty volumes at a time, the number depending on the amount of subscription paid. Practitioners in Australia will find the index and its supplement of considerable value as a catalogue of medical books. The books are indexed according to authors' names and also according to subjects. This index should find a place on the shelves of every medical library.

<sup>1</sup> "Personal Mental Hygiene", by Dom Thomas Verner Moore, O.S.B., M.D., Ph.D.; 1947. London: William Heinemann (Medical Books), Limited. 8½" x 5½", pp. 340. Price: 21s.

<sup>2</sup> "The Doctor's Job", by Carl Binger, M.D.; 1947. London: George Allen and Unwin, Limited. 8½" x 5½", pp. 244. Price: 12s. 6d.

<sup>1</sup> Supplement to the Catalogue of Lewis's Medical, Scientific and Technical Lending Library, including a Classified Index of Subjects with the Names of Those Authors Who Have Treated upon Them; 1947. London: Lewis's Library. 8½" x 5½", pp. 180. Price: 5s. (2s. 6d. for subscribers).



# The Medical Journal of Australia

SATURDAY, JANUARY 3, 1948.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

## A NEW YEAR'S RESOLUTION.

WITH the coming of a new year many people make what they call new year resolutions. Too often the folk who do this are not very serious and their resolutions are like pie-crust—made to be broken. They remind one of the man who declared that it was simple to give up smoking and that he had done it dozens of times. But the idea behind a new year resolution is sound; there is a suggestion that the individual has taken stock of himself, his equipment or his position in relation to persons and events, and that he has discovered deficiencies. The manager of a business, large or small, must take stock from time to time. He has to know what he has disposed of in the financial period just ended and how he stands in regard to the new period. He has to consider the gathering of new stock and he must try to assess the state of the market—its needs and what may be called its temper. Say what we will, life is a business. We all have stock in our abilities and our attainments and we may use them with profit to ourselves and to others, or we may misspend them or allow them to be dormant, unused, like the man who wrapped his talent in a napkin. We are now entering on a new year and we ought to make up our minds what we are going to do with it both as individuals and as members of a profession which is credited more than any other with nobility.

The events of the past year may be looked at from two points of view, that of the individual practitioner and that of the profession as a whole. Every practitioner must decide for himself whether he has tried to keep his medical knowledge up to date by study of various kinds and whether he has been diligent in the care of his patients. He will also know whether he has tried to take an intelligent interest in medicine in relation to the community. There is no way in which this can be determined by somebody else. The scientific gatherings of the profession have been attended much as usual during the past year and medico-political discussions have attracted perhaps a little more interest than is generally accorded to them—the reason for the latter is obvious.

The new year resolution that each practitioner should make is that he will in the coming twelve months allow neither scientific teaching nor matters of medico-political importance to pass him by. There is no need to traverse the various ways in which the practitioner may further his private study by journals, books, post-graduate courses and the usual scientific meetings of the British Medical Association and other scientific bodies. Important events are to take place in 1948, some of them of scientific importance, others of medico-political or sociological interest. First among the scientific fixtures is the sixth session of the Australasian Medical Congress (British Medical Association) to be held at Perth next August under the presidency of Dr. D. M. McWhae. Present indications are that the scientific discussions will be of a high order and that the attendance will be large. The Royal Melbourne Hospital is to celebrate its centenary, and part of the celebration is to take the form of a series of gatherings at which papers will be read and discussed. This scientific gathering will be held in March. At some time in the year, possibly towards the end, a meeting is to be held in London to establish a British Commonwealth Medical Council and it is hoped that representatives will attend from each of the units in the British Commonwealth of Nations. Australian representation will be discussed at the next meeting of the Federal Council. The intentions of the Commonwealth Government in the establishment of a national medical service will take up much of the Federal Council's time and at the first meeting the Branches will indicate their views on the advisability of undertaking further conferences with the Government. The Branches have had plenty of time to debate this question since the last meeting of the Federal Council. Branch meetings and meetings of local medical associations or subdivisions have been or are to be held, and individual members ought to be thoroughly conversant with the facts. The other meetings of the year will comprise those of special groups or societies; and incidentally it may be mentioned that some of these will be held at Perth on a date that will be close to the date of the congress.

To make a resolution is good, to try to keep it is better; of basal importance is the motive lying behind it. Always must we come back to the question of motive; it is the criterion on which all actions can be judged. Monsignor Fulton J. Sheen put the matter well in a sermon preached at one of the three religious services<sup>1</sup> held in connexion with the centenary of the American Medical Association in June, 1947. He said that because the physician had one of the noblest vocations given to man, namely to minister to the temple wherein Divine Resemblance dwelt, he would always maintain a personal relationship with his patients, based on that of service and function, not on profit and gain. Discussing State medicine, the preacher said that when doctors opposed it because they could not make as much money as they did at present, then State medicine was inevitable. When doctors opposed State medicine because they wanted to maintain a personal relationship with their patients, then the compulsory organization of human service was impossible. Carl Binger, in his book "The Doctor's Job",

<sup>1</sup> The Journal of the American Medical Association, August 23, 1947.

reviewed in this issue, reminds us that good medical care depends upon good doctors and enough of them and upon good hospitals and enough of them. These are doctors whose motives are concerned with good medicine and with nothing else. In another of the sermons preached at Atlantic City, Dr. Joshua Loth Liebman said that there were enormous dangers ahead for religion and for medicine—the danger of religion's succumbing to a rigid dogmatism or a pride in the vested interest of ideas inherited from the past; of medicine's succumbing to an idolatry of its own techniques, a worship of a part of life as the whole of life, a blind unwillingness to see the wider context of Divinity in the world. He declared that there were dangers confronting the whole human enterprise—"the world is going to have to become better than it has ever been or there will be no world". The choice for mankind lay between the "isotopes of healing" and the "radioactivity of death". It has been said that the real division at present is between those on the one hand who fancy that they can by force attain freedom, and on the other those who see that the use of incorrect means will make those who use those means unfit to achieve the end. Another division is between those who have the conceit to think that the past is all bad and that the future which they will build and control is all good. Someone has declared that what we learn from history is that we do not learn from history. If that was not so, the divisions mentioned would not be so great. The divisions named are found in the world of medicine as well as in the wider field. And this brings us to another consideration apart from motive in the making of a new year's resolution; some would say that it had to do with generosity of mind, others that it was only common sense. All our ideas, all our plans, in the sphere of medical politics, or in any other sphere for that matter, are never entirely good; nor are those of the man opposed to us entirely bad. If we spend some time looking for our own mistakes and trying to discover the virtues in our opponent's views, we shall be likely to accomplish something for the common good. Dr. Liebman said that doctors and religionists were needed who were filled with the spirit of Walt Whitman: "I know that all men ever born are my brothers . . . in all people I see myself . . . I will not have a single person slighted or left away . . . I do not ask the wounded person how he feels . . . I myself become the wounded person. Behold I do not give lectures or a little charity. When I give, I give myself. Whoever degrades another degrades me." If we have this spirit within us we shall keep our new year's resolution and we shall in truth be able to claim that we belong to a noble profession.

### Current Comment.

#### DELAY IN THE DIAGNOSIS OF CANCER.

IN every campaign directed against cancer, stress is laid, and rightly so, on the vital importance of early diagnosis. Modern treatment offers very real hope—and sometimes more than hope—to the patient with most forms of cancer if it is in its early stages. Yet it is still an unfortunate fact that many cancers are not diagnosed until they are beyond cure and even beyond reason-

able palliation. In 1938 Pack and Gallo, in New York, surveyed 1000 cases of cancer and determined where the culpability for the delay in diagnosis lay—on the medical practitioner, the patient, or both. To determine if any progress has since been made, John E. Leach and Guy F. Robbins have recently made a similar survey at the same hospital, using 500 random case histories of cancer patients.<sup>1</sup> The patient was considered at fault if: (a) he delayed three months or more after first symptoms until he consulted a physician, or (b) he refused to follow acceptable advice. The medical attendant was considered culpable if: (a) he failed to arrive at a diagnosis in a month or, if unable to do this, did not refer the patient to a suitable person, hospital or clinic; (b) he failed to give proper advice or any counsel at all, or failed to apply proper therapeutic measures; (c) he failed to refer the patient to a suitable person, hospital or clinic when the patient failed to improve.

There are obvious difficulties and fallacies in the interpretation of the data, but the proportion of cases in which no significant delay occurred has increased from 20.7% to 29.4%, an appreciable if not tremendous improvement. This improvement appears to be wholly due to more prompt action by the patients, "the patient is seeking help earlier but the physician does not appear to be taking advantage of the improved opportunity". Further analysis relating to the type of cancer present shows that, as one progresses from the superficial group, in which the lesion should be fairly obvious, to those groups, in which a more searching examination or special diagnostic study is required to effect a diagnosis, the patient becomes increasingly culpable, while the blame attributable to the doctor increases. In almost one-half of the cases of breast cancer there was no delay; this can probably be attributed to the publicity given to this type of lesion, even though most of the delay that did occur was the patient's and not the doctor's fault. On the other hand there was great delay associated with superficial lesions, such as those of the skin, lip and tongue; the patient was at fault in the great majority of cases, a fact suggesting that, despite propaganda, many people refuse to be impressed by the superficial lesion which does not cause appreciable symptoms. Of the delay attributable to the medical attendant, wrong treatment was a prominent cause in all types of lesion; almost one half of the patients with cancer of the breast received improper advice (mostly unjustified reassurance); in almost one-half of the cases when special investigation was required, there was undue delay in making the diagnosis. It is appropriate at this point to call attention to a recent article by Sir Heneage Ogilvie on the early diagnosis of cancer of the oesophagus and stomach.<sup>2</sup> This article is eminently readable and practical and, as it will be available to most of our readers, detailed comment is not necessary. Ogilvie's main contention is that "the early diagnosis of cancer in any internal organ depends, in the main, on clinical judgement, on the early confirmation of what can, in most cases, be no more than a suspicion". He has some wise things to say on the appreciation of early signs and symptoms; on the sensible approach to the patient which does not alarm him unnecessarily, but does not delay full investigation when it is indicated; and on the importance of exploratory operation if doubt still exists—"there is more rejoicing in heaven over the one laparotomy that fails to find cancer than over the ninety-and-nine (positive ones) that find it too late".

Leach and Robbins, in discussing the results of their survey, make it clear that they are not concerned to criticize the medical profession; but the treatment of cancer has made considerable advances, of which the general public is aware, and it is up to the profession to do its utmost to overcome the outstanding faulty factor: delay in effecting a diagnosis and commencing treatment. They stress the importance of a careful history and physical examination, followed, if necessary, by special

<sup>1</sup> *The Journal of the American Medical Association*, September 6, 1947.

<sup>2</sup> *British Medical Journal*, September 13, 1947.

investigations; of the encouragement of annual physical examinations of all patients, especially those over forty years of age; and of impressing the patient sufficiently to ensure cooperation, though it is not always necessary to inform him of the diagnosis or suspected diagnosis. They rightly feel that the responsibility for handling this crucial phase of the disease rests on the general practitioner, rather than the specialist. "The means for reducing morbidity and mortality due to cancer are at hand now. They remain to be used."

#### THE ACTION OF FOLIC ACID ON SULPHONAMIDE BLOOD DYSCRASIAS.

THE blood dyscrasias caused by the administration of sulphonamide drugs both in human subjects and in the experimental animal are well known. In animals such as the rat the action of the less soluble drugs of this series is believed to be due to the inhibition of folic acid production in the intestinal tract. The soluble sulphonamides are, however, more important in the treatment of human infections, and therefore the blood disturbances due to these agents seem to be a more fruitful study to pursue. It is considered by some that sufficient even of the soluble drugs may be retained in the intestinal tract to produce some local bacteriostasis. H. G. Petering, R. A. Delor and H. C. Murray have carried out an investigation of the effect of crystalline folic acid, liver extract powder, yeast extract, and para-aminobenzoic acid in preventing the occurrence of blood dyscrasias in rats to which sulphonamides have been given in the food over a prolonged period.<sup>1</sup> These animals were fed on a standard diet to which all necessary protective accessory substances were added. The antagonistic effect of the folic acid supplements on the antibacterial effect of the drugs was studied *in vitro* with a strain of hæmolytic streptococcus. The sulphonamides studied were sulphanilamide, sulphathiazole and sulphadiazine, which may be taken as representative of the most frequently prescribed preparations of this type. Previous work has shown that some synthesis of folic acid goes on in the intestine of animals receiving insoluble varieties of these drugs. The present authors found that the folic acid administered to the rats protected them against the occurrence of blood dyscrasias. They think, however, that the folic acid requirements of rats may actually be increased by soluble sulphonamides, since they found in their experiments that the administration of para-aminobenzoic acid in dosage sufficient to block the action of the drugs on bacteria was never as beneficial as the other folic acid supplements. One finding of interest was that the inimical effect of sulphathiazole and sulphadiazine on the blood was greater than that of sulphanilamide, and more difficult to prevent. This suggests a parallel with human experience.

The results of these experiments seem to show that folic acid in either free or conjugated form, as in yeast powder or liver extract, will prevent the occurrence of blood dyscrasias of sulphonamide origin and yet will not hinder bacteriostatic action. If this is true of the human subject, it is obviously of importance, not only because of its contribution to safety, but also because the bone marrow would be able to respond normally in infective states without risk of toxic inhibition. Abundant and actively phagocytic leucocytes are wanted to complete the rout of organisms such as the pneumococci in pneumonia, for example. Petering, Delor and Murray made further observations on the growth and mortality rates of their animals, and in all respects they found that the effects produced by the soluble sulphonamides were comparable with those due to sulphasuxidine. Unfavourable effects on growth and viability were also alleviated by the administration of folic acid in one form or another. Liver extract had a more beneficial effect than any other dietary supplement in this regard, but was not superior

in its favourable protective action in saving the bone marrow from disturbance.

This work is one of the many investigations now proceeding in different parts of the world on hæmatopoiesis in health and disease, and, we should add, during treatment with modern powerful drugs. Never has medical science possessed such potent therapeutic weapons, and never have practitioners of everyday medicine needed to display greater care in their administration. The vulnerability of the bone marrow to certain chemical substances has introduced some hazards, but compared with the serious nature of some of the diseases that we can now cure with greater ease and certainty, these risks are small. In addition, the light being shed on the previously obscure mechanisms of blood formation and function has alone repaid the world for the labours of the many laboratory and clinical workers involved.

#### DIPHTHERIA INCIDENCE IN RELATION TO AGE.

THE broad principle of immunization against diphtheria has been generally accepted and it has been widely practised for a good many years. However, various thought-provoking observations are made as its use is followed. One point of interest is the tendency for alterations in the age distribution of the disease. William A. Reilly,<sup>1</sup> in reporting an epidemic of diphtheria among members of the United States military forces while they were in Italy during the war, cites it as a demonstration of diminished adult immunity. His most interesting finding was the fact that 76% of 529 adults were "Schick-negative", as against a rate of 85% to 90% that he considers would have been expected twenty years ago. This increased susceptibility is, he suggests, due to "increased prophylaxis, with its temporary active immunity, and the diminished contact with patients or with carriers, again because of prophylaxis and control measures of isolation, which have been widespread and early". Reilly's opinions are, perhaps, not beyond question, but they are, with the facts recorded, worthy of careful thought.

Another aspect of the question, more clearly related to mass immunization, is seen in the statement in the report on diphtheria mortality in large cities in the United States in 1946<sup>2</sup> that "there is a slight tendency for diphtheria to become relatively more prevalent among the higher age groups"—this refers more particularly to children. The tendency is "slight" when balanced out over the whole nation, but is apparently significant, and it brings forward again the question of duration of artificially acquired immunity. An annotation in *The Lancet* of June 28, 1947, refers to a circular letter issued to medical officers of health in England in which it is pointed out that, during 1945, of 593 children who died of diphtheria only 36 were reported to have been immunized, and of these 36 about 30 had not received a reinforcing dose subsequent to primary immunization in infancy. Varying interpretations could be put on the latter part of this statement as it stands; but the chief medical officer of the British Ministry for Health has been sufficiently impressed by the position to stress the importance of reinforcing doses at the age of four or five years (that is, at the time of school entry) and again at the age of ten years. The American report similarly recommends that "protective boosters should be given at time of school admission and later in life when conditions indicate that it is desirable". Due precautions should, of course, be taken against undesirable reactions.

There is nothing new about this recommendation of reinforcement of immunity at school entry age, but it has not been as widely appreciated as it might be. The almost simultaneous reference to it in both Britain and the United States suggests that it needs publicity.

<sup>1</sup> *American Journal of Diseases of Children*, August, 1947.

<sup>2</sup> *The Journal of the American Medical Association*, August 30, 1947.

<sup>1</sup> *Blood*, September, 1947.



## Abstracts from Medical Literature.

### SURGERY.

#### Meckel's Diverticulum.

JOSEF J. HABER (*The American Journal of Surgery*, April, 1947) offers a brief review of the embryological, the pathological and the histological structures of Meckel's diverticulum. Statistical investigations would indicate that it occurs as an incidental finding in about 2% of human subjects, being twice as frequent in males as in females. It may be present throughout a lifetime without causing any symptoms, but is always a potential source of danger. Between 15% and 20% of all the diverticula are subject to pathological changes. The author gives a classification of the types of pathological changes which may occur, and, in discussing diagnosis, states that rarely is a correct pre-operative diagnosis of Meckel's diverticulum made. A surprising feature of the review is the high incidence of the presence of heterotopic tissue, particularly gastric, in these diverticula. Twenty-two cases of Meckel's diverticulum are analysed and five cases of small bowel obstruction due to different types of Meckel's diverticulum are described in detail.

#### A Statistical Study of 1405 Cases of Cancer of the Stomach.

W. L. HARNETT (*The British Journal of Surgery*, April, 1947), who is the medical secretary of the Clinical Cancer Research Committee, presents a detailed statistical study of 1405 cases of cancer of the stomach treated in hospitals of London during seventeen months in 1938 and 1939. Statistics of operability rate and resectability rate, of age incidence, weight loss, frequency of lymph node metastases and other factors are analysed and compared with similar figures from the Mayo Clinic.

#### Ruptured Urethra Treated by Traction on the Bladder.

P. MARTIN (*The Lancet*, May 31, 1947) describes a new method of approximating the torn ends of the ruptured urethra. Suprapubic cystostomy is performed, through which the bladder wall is inspected and its integrity verified, and a gum-elastic catheter is passed along the urethra from the bladder as far as it will go. With the catheter held in position by an assistant, the patient's legs are held up and a Foley's catheter is passed down the penile urethra till it meets obstruction. Next the perineum is opened in the mid-line and the ends of the two catheters are sutured together. The gum-elastic catheter is then withdrawn and it draws behind it into the bladder the Foley's catheter. No suture of the perineal wound is necessary. The bag of the Foley's catheter is now distended with 20 millilitres of water and the suprapubic tube is inserted obliquely through the abdominal wall. The divided ends of the urethra are then brought together by applying a continuous traction of two pounds' weight to the end of the Foley's catheter by a cord over a pulley at the end of the bed. After a fortnight the bag of the Foley's catheter is emptied and the catheter

withdrawn. A sound is then immediately and very gently passed. This is an anxious moment. Two or three days later when the patient starts passing urine, the suprapubic tube is withdrawn. Sounds are passed weekly and then at longer intervals. Three cases are reported in which this procedure was carried out successfully.

#### Tumours of the Carotid Body.

FRANK H. LAHEY AND KENNETH W. WARREN (*Surgery, Gynecology and Obstetrics*, September, 1947) give a résumé of the history, anatomy, histology and pathology of carotid body tumours. They state that these tumours are by no means rare and that they have two undesirable qualities. They become malignant in a certain percentage of cases and they occasionally so surround the common, external and internal carotid arteries and are so fused with them that removal can be accomplished only by ligation of these vessels. This procedure has been associated, in the experience of the authors, with a mortality and morbidity which is forbidding. They report on 13 carotid body tumours from their clinic and discuss their diagnostic features, problems of surgical removal and the percentage of malignancies in this series. From the point of view of diagnosis, the four laterally located tumours of the neck which are single, discrete and movable in character are branchial cysts, carotid body tumours, single, large, lateral, aberrant, thyroid tumours and neuro-fibromata, the frequency of occurrence being in the order given. The most frequent differentiation which needs to be made is between branchial cyst and carotid body tumour. This differentiation may be, at times, difficult. Because one cannot be sure pre-operatively whether ligation of the common, internal and external carotid arteries may be necessary to ensure complete removal of the tumour, the authors advise that carotid compression for ten minutes three times a day should be employed. If this cannot be endured by the patient without symptoms, the fact suggests that, if ligation of the arteries is necessary at operation, the result will not be good. The ideal treatment of carotid body tumours is complete surgical excision. The hazards of total extirpation, which derive from the necessity of ligating the carotid vessels in which total excision is practised, are such as to justify not employing this procedure. In approximately 75% of the cases the tumour is entirely asymptomatic, the presence of the cervical swelling being the only evidence of the disease. The symptoms in the remaining 25% are usually trivial, and only rarely are these tumours attended by serious manifestations such as syncope. Finally, the lesions grow very slowly in most instances. Pathologically, it is estimated that 15% to 20% of carotid body tumours are malignant. In the material observed at the Lahey Clinic there were no proved instances of malignancy in the 18 cases reported. The correct pre-operative diagnosis was made in nine instances, that is, in half of the 18 patients operated upon. Excision of the tumour without ligation of the carotid vessels was accomplished in five cases. Excision of the growth with ligation of the common, internal and external carotid artery alone was

interrupted in two cases. The tumour was not excised in five cases in which operation had been undertaken, because complete removal of the growth would have required carotid ligation. Subtotal resection was carried out in one instance, simple exploration in two, and biopsy in two others. There was an overall mortality rate of 16.6%, but a mortality rate for surgical extirpation of 23%. When tumours of the carotid body are small, do not surround the vessels and can be extirpated without damage to those structures, removal is justifiable. When carotid body tumours, in their enlargement, project into the pharynx by bulging the pharyngeal wall inward so as to interfere with swallowing, an attempt at removal must be made. In cases in which the tumour so surrounds the carotids that ligation of all the vessels will be necessary, the mortality of this procedure is such as not to justify removal of the tumour.

#### Total Gastrectomy.

HENRY K. RANSOM (*Archives of Surgery*, July, 1947) discusses the subject of total gastrectomy as a report on 60 cases in which the operation was performed by the abdominal route over a nine-year period from 1937 to 1946. The lesions for which the operations were performed were carcinoma (53), gastric ulcer (4), lymphosarcoma (2), and neurofibroma (1). Fourteen patients died, an operative mortality of 23.3%, but of the 46 who survived the operation 31 have subsequently died from recurrence of malignant disease. The average duration of life of these was ten and a half months. Three patients only of the carcinoma group may be considered as representing five-year cures, though all patients with benign lesions who survived the operation are living and are in a satisfactory state of nutrition. The technical details of the operations are discussed and the author considers that, while the results are not brilliant, they seem to indicate that the operation is worth while. It is admitted that in the case of patients who survived for only a few months, the value of the procedure is questionable, but the small number of patients saved would certainly have been lost without treatment. Further, when life is prolonged for a year or more the respite from symptoms which usually occurs would seem to make the operation worthwhile.

#### Compound Depressed Skull Fractures Involving the Superior Longitudinal Sinus.

ABRAHAM KAPLAN (*The American Journal of Surgery*, July, 1947) draws attention to the importance and seriousness of compound fractures of the skull involving the superior longitudinal sinus. The danger is that, when bone fragments are removed at operation, bleeding from the sinus may be sudden and uncontrollable and the patient may die on the table. The walls of the sinus do not lend themselves to ligation and suture, and gauze packing probably increases the risk of cortical damage. Kaplan, who reports two cases, stresses the advisability of endeavouring to recognize cases in which such bleeding is likely to occur, and the necessity of being prepared to deal with it by having ready an adequate block of muscle from the leg or elsewhere, and arranging for a transfusion to be running.

The surrounding scalp should be shaved, and a wound toilet carried out under local anaesthesia. The depressed fragments of skull furthest from the sinus should be elevated and removed first, the surgeon proceeding gradually and taking little bone at a time. The area of the injured sinus is left till last. With the removal of the final fragment any tear in the sinus can be sealed off with the muscle, which is sutured to the edge of the dura if necessary. Bleeding around the margin of the muscle can be controlled by small pieces of muscle, gel foam, or oxycel. The scalp is then closed in a double layer, and penicillin therapy is given.

#### Amputation Lessons from the War.

HENRY H. KESSLER (*The American Journal of Surgery*, September, 1947), who is the amputation consultant to the Office of Vocational Rehabilitation of the Federal Security Agency in the United States, points out that it remained for the Second World War to introduce the conception of rehabilitation in the treatment of the "amputee" in the United States. In the Civil War 50,000 men lost limbs and the furnishing of artificial limbs was not considered a proper function of the military organization. For the 4403 men who lost limbs in the First World War a limited service was provided within the framework of the military hospital. The Second World War introduced the three-dimensional type of service provided at special hospital centres which prepared the "amputee" for return to society. This service is described in five steps, psychological preparation, surgery, after-care of the stump, prosthesis, and training for rehabilitation.

#### Tetra-Ethyl Ammonium.

FREDERICK A. COLLIER *et alii* (*Annals of Surgery*, June, 1947) discuss the properties and uses of tetra-ethyl ammonium, and recount their experiences with its administration in a variety of conditions. The drug appears to exert its effect by blocking the transmission of nervous impulses through the autonomic ganglia, thereby bringing about what the authors term a sympathetic blockade. That this blockade is situated at the ganglia is indicated by the facts that preganglionic stimulation in animals given tetra-ethyl-ammonium is ineffective, while postganglionic stimulation has the usual effect, and that adrenaline, which acts peripherally, can still produce its effects. In man there is a fall in systolic and diastolic blood pressures after parenteral administration of the drug. Peripheral blood flow is increased and skin temperature rises. Other effects include dilatation of the pupil, loss of accommodation, cessation of sweating, dry mouth, postural hypotension, and reduction of plain muscle tone and mobility. No action of the drug can be demonstrated in a sympathetomized extremity though an intact extremity in the same individual responds in the usual manner. The authors used a 10% solution of tetra-ethyl ammonium bromide or chloride, given by slow intravenous or intramuscular injection (the minimum time occupied was fifteen to sixty seconds). The dosage ranged from 100 to 500 milligrammes. Elderly patients are more sensitive to the drug, and it is safer in any case of doubt to use small initial doses. The drug is excreted

rapidly by the kidneys. Sometimes the effect of a first dose is slight or absent, although later injections produce the usual response. The authors consider that a fear-reaction may stimulate the secretion of adrenaline and so negative the sympathetic block. Tetra-ethyl ammonium has proved of value for temporarily diminishing the pain of causalgia, post-traumatic painful states, *herpes zoster*, Buerger's disease and thrombophlebitis, and in certain cases the improvement has been sustained. The drug affords a valuable means of testing the effect likely to be obtained by a sympathectomy. Some undesirable side-effects necessitate certain precautions during administration. The authors, in an experience covering 1500 injections, have kept single doses within a maximum of 500 milligrammes, but have given up to 42,000 milligrammes over a period of six weeks without unfavourable sequelae. Undesirable falls in blood pressure may be countered by the Trendelenburg position and the injection of a few minims of adrenaline.

#### Tumours of the Testicle.

F. H. COLBY (*The New England Journal of Medicine*, April 24, 1947), summarizing recent writings on testicular neoplasms, draws attention to a recent emphasis on their surgical treatment by high ligation of the spermatic cord in the inguinal canal with removal of the affected scrotal contents through the incision without opening the *tunica vaginalis*. This procedure, which is not new, lessens the likelihood of local recurrence from implantation of tumour cells, which may be present in the hydrocele fluid.

#### Torsion of the Spermatic Cord.

DONALD S. JURNOVE (*The American Journal of Surgery*, July, 1947) discusses torsion of the spermatic cord (sometimes incorrectly termed torsion of the testis). Although the condition is not dangerous to life, it is likely to lead to testicular gangrene or atrophy and its prompt recognition and treatment are important. The condition may occur at any age, but the average onset is during adolescence, and incomplete descent of the testis appears to predispose to torsion. Other possible factors include an abnormally large *tunica vaginalis*, an abnormally long or absent *gubernaculum testis*, and separation of the testis from the epididymis. The torsion of the cord may occur within the *tunica vaginalis* or be situated at a higher level, the direction of twisting being usually towards the mid-line. Symptoms include sudden severe testicular pain and tenderness, and may follow trauma or strain, or even arise during sleep. The pain may be referred to the abdomen and simulate an abdominal emergency with associated nausea and vomiting. Repeated attacks of testicular pain without urinary infection are said to be diagnostic of torsion. In the acute state the testicle is tender, slightly swollen, and situated high in the scrotum. The scrotal skin may show oedema up to the level of the torsion (Dillon's sign), while elevation of the testis aggravates the pain (Prehn's sign) instead of easing it as in orchitis and epididymitis. The prognosis for the testicle is poor if the condition is untreated, and acute torsion constitutes a surgical emergency. Manual detorsion (best at-

tempted in the knee-chest position) is sometimes possible, but does nothing to prevent recurrence. Open operation is the procedure of choice as the amount and direction of twist can be seen and orchidectomy or orchidopexy performed as appropriate. The testis may be wrapped in warm moist pads while its viability is being studied; the author quotes Chase's suggestion that the patient be given pure oxygen to inhale, and mentions the possibility of injecting procaine (presumably into the cord) to relieve vasospasm. If the contralateral testis is incompletely descended, consideration should be given to the advisability of relieving this at the same time. If a patient has had recurrent attacks of torsion with spontaneous correction, operation should be recommended to avoid the danger of testicular atrophy. A case of torsion of the spermatic cord is reported.

#### Fat Necrosis of the Female Breast.

FRANK E. ADAIR AND JEAN THOMPSON MUNTZER (*The American Journal of Surgery*, August, 1947) discuss fat necrosis of the female breast in the light of an experience covering 110 proved cases. They recall that in 1920 Lee and Adair presented the first report and established the condition as an entity. Although trauma, accidental or surgical, is the single most important predisposing factor known at present, the authors now consider that the qualifying word "traumatic" should no longer be retained in referring to the lesion, and prefer the non-committal term "fat necrosis of the breast". The authors emphasize the striking clinical similarity to carcinoma and the difficulties in diagnosis. In the series of 110 cases the age extremes were fourteen and eighty years, the peak incidence coming in the fifth decade and the general distribution falling in the so-called "cancer decades". Of the 41 patients with a significant history of trauma 12 had had a surgical operation, three had had hypodermoclysis, while the remaining 26 described a single episode of fairly violent physical trauma, sufficiently severe in 21 instances to produce ecchymosis. In 35 of the above patients the resultant mass developed within a year of injury, but in six there was an interval extending up to many years. The authors emphasize the difference between the definite character of the trauma in the cases noted above and the vague histories of injury often related by patients with carcinoma. No consistent clinical differences could be traced between the groups with traumatic aetiology and those without. In discussing the clinical features of fat necrosis the authors stress the frequency of attachment of the swelling to the skin. This was present in 58% of their patients, while in nine instances there was evidence of attachment to deeper structures. In 14 patients the nipple was elevated or retracted. For 17 patients out of the total of 110 a correct clinical diagnosis was made. For the remaining patients diagnoses were made of: cancer 30 cases, fibroadenoma 15 cases, chronic mastitis 15 cases, cyst 16 cases, miscellaneous 14 cases; for three patients no pre-operative diagnosis was made. Ten case histories are given in detail. In conclusion the authors emphasize that in their view no woman should be submitted to radical mastectomy unless the presence of a malignant tumour has first been proven.

## Bibliography of Scientific and Industrial Reports.<sup>1</sup>

### THE RESULTS OF WAR-TIME RESEARCH.

During the war a great deal of research was carried out under the auspices of the Allied Governments. It has been decided to release for general use a large proportion of the results of this research, together with information taken from former enemy countries as a form of reparations. With this end in view, the United States Department of Commerce, through its Publication Board, is making a weekly issue of abstracts of reports in the form of a "Bibliography of Scientific and Industrial Reports". This bibliography is now being received in Australia, and relevant extracts are reproduced hereunder.

Copies of the original reports may be obtained in two ways: (a) Microfilm or photostat copies may be purchased from the United States through the Council for Scientific and Industrial Research Information Service. Those desiring to avail themselves of this service should send the Australian equivalent of the net quoted United States price to the Council for Scientific and Industrial Research Information Service, 425, St. Kilda Road, Melbourne, S.C.2, and quote the PB number, author's name, and the subject of the abstract. All other charges will be borne by the Council for Scientific and Industrial Research. (b) The reports referenced with an E number may be obtained in approved cases without cost on application to the Secondary Industries Division of the Ministry of Post-War Reconstruction, Wentworth House, 203, Collins Street, Melbourne, C.I. Copies of these are available for reference in public libraries.

Further information on subjects covered in the reports and kindred subjects may be obtained by approaching the Council for Scientific and Industrial Research Information Service, the Secondary Industries Division of the Ministry of Post-War Reconstruction, or the Munitions Supply Laboratories (Technical Information Section), Maribyrnong, Victoria.

PB M 63829. JANDORF, BERNARD J., *et alii*. Metabolic effects of a nitrogen mustard on mouse Sarcoma 180. No date. 1 p. Price: Microfilm, \$1.00; Photostat, \$1.00.

In view of the reported anticarcinogenicity of methyl bis ( $\beta$ -chloroethyl)-amine, its action was studied on slices of Sarcoma 180, grown by subcutaneous transplantation in male Carworth Farms mice. The compound was found to produce an inhibition of respiration and of aerobic lactic acid formation in the sarcoma slices. This document, which is apparently an abstract of a report, is a contribution from the Medical Division, Edgewood Arsenal, Maryland.

PB M 63799. KAREL, LEONARD, AND MEYER, BERTRAM J. Effects of thiosorbitol and of iodides on alphanaphthylthiourea toxicity in rats. No date. 2 pp. Price: Microfilm, \$1.00; Photostat, \$1.00.

Of nineteen compounds tested, only thiosorbitol and potassium iodide were successful in counteracting the effects of ANTU. Thiosorbitol, 1.5 grammes per kilogram, given either intraperitoneally or intramuscularly simultaneously with ANTU, reduced the mortality of 1 LD<sub>50</sub> to about 10% and of 2 LD<sub>50</sub>'s to approximately 40%. No decrease in mortality was obtained when 2.5 LD<sub>50</sub>'s of ANTU were used. However, animals receiving thiosorbitol exhibited a definite delay in time of death compared to the controls. This report was prepared in the Toxicology Section, Medical Division, Edgewood Arsenal, Maryland; it is apparently an abstract of a longer report.

PB M 63800. KAREL, LEONARD, AND WESTON, RAYMOND E. Femoral arterial and venous blood nitrogen content of dogs during denitrogenation by continuous oxygen inhalation. No date. 1 p. Price: Microfilm, \$1.00; Photostat, \$1.00.

The nitrogen content of femoral arterial and venous blood was determined at successive intervals up to 360 minutes in anesthetized dogs during denitrogenation by continuous inhalation of 99.6% oxygen, or a 95% oxygen, 5% carbon dioxide mixture, through a tracheal cannula, according to this abstract. Nitrogen analyses were made by the Edwards, Scholander, and Roughton method, with occasional checks being made by the Van Slyke or the Horvath and Roughton manometric methods. The abstract was prepared in the Toxicology Section, Medical Division, Edgewood Arsenal, Maryland.

<sup>1</sup> Supplied by the Information Service of the Council for Scientific and Industrial Research.

PB M 63831. KAREL, LEONARD, *et alii*. The intraperitoneal toxicity of some glycols, glycol ethers, glycol esters, and phthalates in mice. No date. 2 pp. Price: Microfilm, \$1.00; Photostat, \$1.00.

The acute intraperitoneal median lethal doses for sixteen solvents of the groups listed above were determined in Carworth Farms female albino mice. The LD<sub>50</sub>'s in millimoles per kilogram and the pathological changes produced by the individual solvents are noted briefly. This document, which appears to be an abstract of a report, is a contribution from the Medical Division, Edgewood Arsenal, Maryland.

PB M 50296. LARSON, LEONARD A. A factor analysis of some cardio-vascular-respiratory variables with particular reference to the Schneider and the McCurdy-Larson tests. (CAA Div. of Res. Rept. 17.) July, 1943. 28 pp. Price: Microfilm, \$1.00; Photostat, \$2.00.

The purposes of this study are (i) to analyse selected cardio-vascular-respiratory variables for their principal components and (ii) to determine the physiological characteristics of ten selected cardio-vascular test index scores on the basis of the isolated factors. The various measures obtained on 145 men majoring in health and physical education were studied by means of the Thurstone method of factor analysis and analysed in relation to earlier findings in physiological research.

PB M 63832. LUBIN, M., AND HIMWICH, H. E. Effect of methyl fluoroacetate (MFA) on the hepatic pyruvate exchange. (Abstract.) January, 1947. 1 p. Price: Microfilm, \$1.00; Photostat, \$1.00.

Previous work with methyl fluoroacetate (MFA) *in vitro* indicated that it interferes with oxidation, probably in the tricarboxylic acid cycle. The present experiments were designed to test this hypothesis *in vivo*. The results indicate that a latent period is apparently required before the activity of MFA is manifested. The shift in pattern suggests diminished pyruvate oxidation. This abstract of a report is a contribution from the Medical Division, Edgewood Arsenal, Maryland.

PB M 60925. McNAMARA, B. P. Pharmacological antagonism between stereo-isomers of hexachlorocyclohexane. No date. 1 p. Price: Microfilm, \$1.00; Photostat, \$1.00.

This brief document summarizes the neurological effects produced by intravenous injection of the gamma and the delta isomers of hexachlorocyclohexane. In several types of experiments with rabbits and dogs, prophylactic treatment with the delta form inhibited or reduced the symptoms which would have normally been produced by the gamma form. This document covers work performed by personnel of the Medical Division, Edgewood Arsenal, Maryland.

PB M 67774. SCHOLTZ, G., *et alii*. Increasing height resistance by means of repeated chamber ascents. February, 1944. 10 pp. Price: Microfilm, \$1.00; Photostat, \$1.00.

This is a translation of an article in the German periodical *Luftfahrtmedizin*, Volume VIII, Number 4, published February 20, 1944. It was proved that subjects could raise their height resistance by one to two kilometres if they were repeatedly exposed to a negative pressure corresponding to a height of 5000 metres for about three weeks for one hour twice weekly. Before and after acclimatization in the pressure chamber the following could be shown in the transposition mechanism against quickly arising hypoxia of tested subjects. The hyperventilation rate exhibited no characteristic alteration. With the exception of one case, the oxygen consumption of the arterial blood through the tissues was raised with every subject. The growth of the "Vakat" oxygen quotients caused by hypoxia lessens with acclimatization. These results seem to indicate that height acclimatization of the organism comes about mostly by means of the adaptation of the tissues. German annotated tables of data are included.

PB M 50313. WENDT, G. R., AND LINDSLEY, D. B. Studies in motion sickness. Series A. (CAA Div. of Res. Rept. 40.) December, 1944. 44 pp. Price: Microfilm, \$1.00; Photostat, \$3.00.

This material consists of two reports and a note on research. (1) "A study of the subjective effects of small doses of benzedrine sulphate on individuals susceptible and those non-susceptible to motion sickness, including observations on psychogenic symptoms." The obtained results are of interest as indicating the existence of a difference between susceptibles and non-susceptibles, even though the identification of the nature of the behaviour in which they differ is not certain. (2) "An investigation into the relationship of the electroencephalogram to motion sickness susceptibility." Susceptibility to sickness from motion is not accompanied characteristically by a deviant condition of high nervous activity as represented by the electroencephalogram. (3) "A note on an unsuccessful effort to investigate the effects of temperature on vestibularly induced nausea." One group of



subjects was subjected to a modified form of the Dorcus tilting procedure at a room temperature of 70° F. The other was subjected to the same procedure at a room temperature of 90° F. The ear canal of the subjects was irrigated with ice water.

PB M 62509. TEMKIN, OWSEL, AND RAMSEY, ELIZABETH M. Antimalarial drugs: General outline. March, 1944. 141 pp. Price: Microfilm, \$3.00; Photostat, \$10.00.

This report was intended to give the general background of present knowledge of the treatment of malaria by drugs under existing war conditions. After a survey of the quinine situation, the synthesis of new antimalarial drugs ("Plasmoquine", "Atebrin", sulpha compounds) and new principles of treatment are described. The bulk of the material deals with clinical and laboratory experiences with antimalarial drugs. This section is subdivided into (a) cinchona alkaloids, (b) "Atebrin", (c) "Plasmoquine", (d) treatment plans of malaria under present war conditions, (e) sulphonamide compounds, (f) thiobismol, (g) arsenicals, (h) antimonial, (i) mercurials, and (j) miscellaneous drugs. A bibliography of 237 items is attached.

PB M 63279. TOBIAS, JULIAN M. Studies on the sodium, potassium and water content of tissues in the cockroach (*Periplaneta americana*). No date. 1 p. Price: Microfilm, \$1.00; Photostat, \$1.00.

To clarify the implications of the statement seen in discussions of insect hemolymph, that "Of the cations, sodium seems always to be replaced largely by potassium" (Wigglesworth: "Principles of Insect Physiology"), the water, sodium and potassium content of whole hemolymph and serum, nerve cord and leg muscle were measured in the cockroach (*Periplaneta americana*). There were no indications, according to this abstract, that the cation concentration gradient which may exist between irritable tissue and its environment is fundamentally different (except quantitatively) in the insect from that in other forms. The author is associated with the University of Chicago Toxicity Laboratory and the Department of Physiology.

PB L 55802. HARVARD UNIVERSITY. GRADUATE SCHOOL OF BUSINESS ADMINISTRATION. The effects of variations in blood sugar on stereo and vernier acuity. June, 1942. 11 pp. Price: Microfilm, \$1.00; Photostat, \$1.00.

Studies were made to determine the effects of variations in blood sugar on stereo and vernier acuity. Sixteen subjects came to the laboratory in a basal condition and observations were made on stereo acuity. They were then given dextrose to observe any possible effects due to an increase in the blood sugar level. Another series of experiments were carried out in which range estimates for both stereo and vernier acuity were made while the subject was in a basal state and again at standard intervals after the injection of insulin. At the conclusion of each insulin test the subject took in dextrose, after which observations were repeated on stereo and vernier acuity. The latter experiments were repeated twice. In the first series a moderate dose of insulin was given, and in the second series a fairly large dose was given to lower the blood sugar to approximately 50 milligrammes per centum. No significant differences were observed in the stereo range settings made under basal as contrasted to non-basal conditions. When the level of the blood sugar was lowered by insulin, however, there was an increase in variability and in some cases even a departure from true range. Vernier acuity appeared to be more easily influenced by the lowered blood sugar than stereo acuity. This was especially true with the larger doses of insulin. The results indicate therefore that vernier acuity is more easily varied than stereo acuity by the stress imposed by lowered blood sugar. Tables and graphs are included.

PB M 67636. BRYSON, VERNON, et alii. Problems of aerosol therapy, with special reference to the calibration of dosage, and antibacterial synergism. Final report (with addendum, January, 1947). November, 1946. 55 pp. Price: Microfilm, \$2.00; Photostat, \$4.00.

This sixth and final report includes a review of previous investigations and includes certain hitherto unreported data. It is divided into the following sections: (i) introduction containing details of contract pertaining to the field of investigations; (ii) calibration of procedures in use at Edgewood Arsenal and the Western Pennsylvania Hospital, Pittsburgh, Pa., for the administration of penicillin aerosols to experimental animals; (iii) the development of a method for the administration of aerosols absorbed into the blood stream when administered by inhalation; (iv) determination of possible additive effects of administration of penicillin when administered by inhalation of aerosols and concurrently by other routes; (v) a study of the biological effects of aerosols of penicillin, other antibiotics and chemotherapeutic agents administered with and without detergents or other synergistic substances, with and without agents intended to

delay absorption; in normal animals and in animals with experimental pneumonia; (vi) administration of aerosols composed of penicillin in oil; and (vii) immunization of mice against pneumococcal infection with aerosolized capsular polysaccharide. Tables and addendum covering correction to Sections (iv) and (vii) are included. This report and addendum were prepared at the Biological Laboratory, Cold Spring Harbour, N.Y., and are signed by M. Demerec.

PB M 55806. HARVARD UNIVERSITY. GRADUATE SCHOOL OF BUSINESS ADMINISTRATION. Loss of sleep, benzedrine, and stereo acuity. June, 1942. 7 pp. Price: Microfilm, \$1.00; Photostat, \$1.00.

The effects of loss of sleep for periods of 23 to 27 hours were studied in relation to variations in range estimates. Four subjects were used in the first experiment. Range estimates were made in the p.m. and again in the a.m. after the subjects had remained awake all night. The second experiment with six subjects was similar to the first, with the exception that 20 milligrammes of benzedrine sulphate were ingested after a series of readings taken in the a.m. following the all-night vigil without rest. Twenty minutes after the ingestion of benzedrine sulphate another series of range estimates were taken. Loss of sleep resulted in slight but statistically insignificant increases in the variability of range estimates. Five of the six subjects showed improved performance after the ingestion of benzedrine sulphate. Table and graphs are included.

PB M 50285. DORCUS, ROY M. The influence of physiologically effective doses of epinephrine on vestibularly induced nausea. (CAA Div. of Res. Rept. 5.) November, 1942. 11 pp. Price: Microfilm, \$1.00; Photostat, \$1.00.

This study was carried out in the Psychological Laboratory of the University of California at Los Angeles. It described the results of an investigation of the effects of epinephrine on the frequency of vomiting under conditions of vestibular stimulation. Its purpose was to test one aspect of a particular hypothesis of the mechanism of air sickness, that is, the hypothesis that the nausea and vomiting of air sickness are the direct result of fear. Thirty subjects were tested, all male college students, aged nineteen to twenty-three years. Three graphs and four tables are included.

PB M 63801. ELLIS, SYDNEY, et alii. Carbon tetrachloride, liver damage, and acetylcholine esterase activity in the rabbit and the rat. No date. 2 pp. Price: Microfilm, \$1.00; Photostat, \$1.00.

This document, apparently only an abstract or note, points out that acetylcholine hydrolysis by plasma enzymes is low in patients with liver disease. The authors were able to confirm Brauer and Root in their finding that in the rat carbon tetrachloride damage to the liver reduces the acetylcholine hydrolyzing ability of both the plasma and liver. Determinations of the activity of plasma and liver in the hydrolysis of three substrates gave ratios that appear to mean that the enzymes hydrolyzing acetylcholine in the rabbit are either different from those in the rat, or are the same enzymes in different proportions. The document originated in the Medical Division, Edgewood Arsenal, Maryland.

PB M 50337. HELMICK, J. S., et alii. Studies in motion sickness. Series C. (CAA Div. of Res. Rept. 66.) August, 1946. 64 pp. Price: Microfilm, \$2.00; Photostat, \$5.00.

This is the continuation of work reported earlier (see PB 50313 and PB 50331) and consists of four papers: (1) "Circulatory and respiratory responses to cold and to breath holding in individuals susceptible and non-susceptible to motion sickness." At Wesleyan University the relation of motion sickness susceptibility to the cold pressor test (immersion of hand or foot in ice water) and to the effects of holding the breath for a short period was studied. Reactivity was measured by blood pressure, pulse rate and breathing changes. (2) "Experimental comparison of various autonomic responses in individuals susceptible and non-susceptible to motion sickness." Five susceptibles and five non-susceptibles served as subjects on each of six days during which their reactions to epinephrine (adrenaline), acetyl-beta-methyl-choline (methylol), hyperventilation, breath holding, and immersion of the foot in ice water were studied. (3) "A second experimental comparison of autonomic responses in individuals susceptible and non-susceptible to motion sickness." Eleven susceptibles and twelve non-susceptibles served as subjects on each of two days during which the following were studied: dermographia, cold pressor test, breath-holding test with positive and then with negative pressure, reaction to injection of methylol, and reaction to tilt on the tilt table. (4) "Studies of somatic, physiological and psychological correlates of history of motion sickness." This is a brief report of methods and results of early attempts to discover the above correlates. Results on more than 200 variables are presented. Six graphs are included.

## British Medical Association News.

### SCIENTIFIC.

A MEETING of the Victorian Branch of the British Medical Association was held at the Royal Melbourne Hospital on August 20, 1947. The meeting took the form of a series of clinical demonstrations by members of the honorary medical staff of the hospital.

#### Manifestations of Cardiac Lesions.

DR. GEOFFREY A. PENINGTON presented four patients illustrating types of cardiac lesions, namely, congestive cardiac failure with gallop rhythm and *pulsus alternans*, rheumatic carditis with good functional recovery, and auricular fibrillation due to masked thyrotoxicosis.

#### Hypertensive Cardiac Failure, Gallop Rhythm, Pulsus Alternans.

Dr. Penington's first two patients, a woman and her son, were both suffering from congestive cardiac failure following hypertension and both manifested classical gallop rhythm and, at various times, *pulsus alternans*.

The woman patient, who was aged sixty-seven years, had been found to have hypertension when submitted to a routine medical examination at the time of the sudden unexpected death of her husband three years prior to the meeting. Two years before the meeting she had suffered from an attack of dull pain over the front of the chest and in both arms, which lasted all day, and she had been kept in bed for about four weeks. Since that time she had noticed gradually increasing shortness of breath on exertion and had been subject to attacks of nocturnal dyspnoea and orthopnoea. No history of any illness possibly causative of a renal lesion could be obtained, and she had had a pelvic operation six years previously without incident. Examination of the cardiovascular system on August 7, 1947, revealed cardiac enlargement with pulsation of the precordium, a double impulse being visible and palpable with each cardiac cycle. The apex beat was six inches from the mid-line in the fifth left intercostal space, and there was increased dullness to the right of the sternum. Gallop rhythm was audible in the region of the cardiac apex. The pulse rate was 120 per minute, and the blood pressure was above normal—alternate impulses appeared at 192 millimetres of mercury and all came through at 186 millimetres, the diastolic pressure being 124 millimetres. Palpable alternation in strength of pulsation over the radial artery was demonstrable. The liver was palpable to four fingers' breadth below the right costal margin, crepitations were audible and persistently present at the bases of the lungs and oedema was present over the sacrum. The retinal vessels were tortuous and thickened. Aminophylline 0.1 gramme and "Tabloid Digitalis Folia" 0.06 gramme were given orally thrice daily, and "Neptal" (two millilitres) was given intramuscularly, and these resulted in improvement. Injections were being continued twice weekly and diuresis had occurred after each injection, so that oedema had disappeared. The blood pressure had fallen to a systolic reading of 140 millimetres and diastolic of 90 millimetres on August 18, 1947, but the pulse frequency had remained at about 90 per minute and at times *pulsus alternans* was still demonstrable.

The second patient, a man, aged thirty-seven years, had suffered from general ill health, swelling of the ankles and abdomen, and dyspnoea on exertion for five years, although prior to this he had been able to indulge in strenuous exercise, such as football. He had imbibed freely of alcohol for some years, and when admitted to hospital in 1945, in addition to hypertensive cardiac failure, had been considered to have cirrhosis of the liver because of marked enlargement of that organ. He had improved with treatment, and resumed his work as a clerk, but in April, 1947, he was readmitted complaining of nausea and flatulence and increased dyspnoea, despite weekly injections of "Neptal" (two millilitres). A systolic blood pressure of 220 millimetres of mercury and diastolic pressure of 160 millimetres had been persistently present for some months, but on August 19, 1947, the pressures were 190 and 110 millimetres of mercury respectively. On some days, alternation of the pulse was present with a difference of 12 millimetres of mercury between the pressures. The heart was grossly enlarged, the apex beat being in the sixth left intercostal space six inches from the mid-line. A double impulse was visible and palpable over the precordium and typical gallop rhythm was audible in addition to a soft apical systolic bruit. Signs of pulmonary congestion were present. The

liver was visibly enlarged and its edge was palpable one hand's breadth below the costal margin. Visible and palpable systolic pulsation of the liver was evident. There were signs of free fluid in the peritoneal cavity and slight oedema of dependent parts. Various tests of hepatic and renal function had been carried out without disclosing any significant deviation from normal. The blood had not reacted to the Wassermann test. Treatment had consisted in the administration of digitalis leaf, and injections of "Neptal" two to three times each week, and there had been an amelioration of symptoms and subsidence of manifest oedema. The liver had decreased in size, ascites had diminished, orthopnoea had ceased, but the patient was in constant need of hospital attention and spent almost all his time in bed.

Dr. Penington demonstrated the physical signs, the electrocardiograms and the X-ray films of the hearts of these two patients and commented on the unusual occurrence of similar signs simultaneously in mother and son. He commented on the use of aminophylline and digitalis in the so-called low output cardiac failure, and on the work of McMichael and Sharpey-Schaefer in connexion with the effects of those two preparations in lowering venous pressure and thus increasing cardiac output in accordance with Starling's law. It was put forward that the value of Fowler's position in cardiac dyspnoea was due to the effects of that posture in lowering venous pressure in the auricle. The term "gallop rhythm", in his opinion, should be restricted to that form of triple rhythm of grave prognostic significance, which was found in patients with some other evidence of cardiac failure, in whom the pulse rate was above normal, and should never be diagnosed unless the additional impulse was palpable as well as audible. He demonstrated that sometimes the additional impulse was more easily seen than felt. The explanation given by Crichton Bramwell was considered to provide the best reason for the phenomenon, and Dr. Penington described this in some detail, stressing that shortening of the diastolic period resulted in augmentation of passive diastolic filling of the ventricle by auricular systolic flow. Confirmation of that explanation was to be found in the disappearance of the abnormal third sound when the frequency of the beats decreased, the diastolic period being thus prolonged and this augmentation effect prevented. He suggested that other triple rhythms should be referred to as reduplication of first or split second sounds as applicable, and that the normal third sound heard in healthy young people should be specifically described as such.

The presence of *pulsus alternans* was considered to be confirmatory evidence of the grave prognosis of the two patients, even though the manometric readings did not disclose a big difference in strength of the impulses, alternation was not demonstrable in electrocardiograms, and the condition was not present constantly.

The unusual sign, pulsation of the liver, was stated by Dr. Penington to be an indication of incompetency of the tricuspid valve, in that instance due to the enormous cardiac enlargement with dilatation rather than to actual valvulitis.

Dr. Penington said that the value of mercurial diuretics in relieving oedema and in obviating nocturnal dyspnoea had been reaffirmed; the diuretic effects of the injections of "Neptal" had been enhanced by the administration of ammonium chloride 1.25 grammes given two hours prior to, and repeated at the time of, the injection.

#### Rheumatic Carditis: Mitral and Aortic Valvulitis.

Dr. Penington then presented a male patient, a painter, aged thirty-three years, who had first sought medical advice in 1933 with the history that he had suffered from scarlet fever at the age of twelve years. In 1932 (he was then aged eighteen years) he had had a severe attack of rheumatic fever, recurring four months later with pleural effusion on the left side, and possibly pneumonia. He was in hospital for ten months on that occasion. In 1933 he had evidence of rheumatic carditis and had severe pains in his joints and about the thorax, which were resistant to salicylates, but eventually responded. His tonsils, which were grossly infected, were removed early in 1934. In 1936 he suffered a recurrence of joint pains and was febrile for one month, being kept in hospital for two months. Thereafter he was kept under observation in the out-patient department and was found to have an improving tolerance of exercise so that after twelve months he was permitted to resume sport, as well as his work, being warned always to keep within his tolerance as indicated by his breathing.

In 1946 he had again been seen with an attack of rheumatic fibrositis and pain in the joints; he stated that he had been so well in the intervening period that he had been able to play lacrosse without any distress. Once again difficulty was experienced in controlling the pains, response to sodium

salicylate in full doses being inadequate. Toxic symptoms developed, but a combination of sodium salicylate and *Acidum Acetylsalicylicum* gave some relief. Excision of a tender rheumatic nodule (histologically diagnosed as such) from the left axilla relieved persistent precordial pain. The physical signs had varied very little during the fourteen years, there having been no further increase in the size of the heart during the period. A rough systolic bruit was audible at the apex of the heart and was conducted outwards into the axilla. A systolic bruit was heard at the base of the heart, and a soft diastolic bruit was present along the left border of the sternum. The pulse pressure was not unduly high and the pulse was not of the typical Corrigan type; there was no definite evidence of aortic stenosis. Electrocardiograms revealed a *PR* interval at the upper limit of normal and slight left axis deviation. The X-ray films revealed moderate enlargement of the left ventricle and dilatation of the left atrium.

Dr. Penington's chief reason for showing the patient was to demonstrate the degree of functional recovery which was possible even with severe and recurrent rheumatic carditis. He emphasized the importance of rest during the active phases and of exercise within the limits of tolerance after the active infection had subsided. The best guides for the patient were his symptoms; and provided that he did not indulge in competitive athletic games and stopped short of producing dyspnoea or distress, exercise would have a beneficial rather than a detrimental effect. All increases in exercise were made gradually.

The patient also illustrated the well-known fact that tonsillectomy did not prevent recurrence of rheumatic fever, and Dr. Penington advised that indications for removal of septic foci were the same for all patients—when the foci were possibly detrimental to health. However, whenever such measures were to be carried out on patients with endocarditis, it was imperative that chemotherapy, preferably by means of penicillin, should be used immediately prior to, and for four to five days after, the surgical procedure. Penicillin had been used to cover the periods when teeth were extracted from the patient in 1946 and 1947.

Dr. Penington also mentioned the importance of chemotherapy whenever an infection with hemolytic streptococci Type A was proven or suspected, because the extracellular products of that organism appeared to be very important and were probably the most important single factor in the causation of rheumatic fever.

#### *Auricular Fibrillation due to Thyreotoxicosis.*

The last patient presented by Dr. Penington was a painter, aged fifty-nine years, who had been admitted to hospital on July 10, 1947, complaining of increasing loss of strength and of weight over a period of six months. He had been found to have auricular fibrillation and was suspected of having gastric carcinoma because of the weakness and loss of weight. When admitted to hospital he was noticed to desire very little clothing; his skin was moist and warm, there was widening of the palpebral fissure especially on the right side, von Graefe's sign was present, and there was a definite tremor. The thyroid gland was not palpable. Auricular fibrillation was present without demonstrable cardiac enlargement and the blood pressure was, systolic, 100 millimetres of mercury, and diastolic, 50 millimetres. On July 10, 1947, the basal metabolic rate was +54%. An intrathoracic goitre was not demonstrable radiologically, but there was slight displacement of the trachea. The vocal cords moved normally. The blood cholesterol was 125 milligrammes per centum. There was no occult blood in the faeces.

Dr. Penington said that he had made a diagnosis of thyreotoxicosis and had instituted treatment with methyl thiouracil 0.2 gramme thrice daily for one week followed by 0.2 gramme twice daily for one week and then 0.2 gramme daily. Lugol's solution was administered in doses of 0.3 millilitre twice daily for the first two weeks. The basal metabolic rate had fallen to +21% on July 26 and on August 4 an attempt was made to restore normal rhythm by means of quinidine sulphate. On two occasions normal rhythm returned, but on reduction of the dose to 0.2 gramme thrice daily fibrillation returned. It was therefore decided to control the ventricular rate by means of digitalis and to postpone any further attempt to restore normal rhythm. Clinically there had been a big improvement in the patient's condition, the isthmus and right lobe of the thyroid gland had become palpable, and a basal metabolic rate of +44% on August 12 was considered not to be a true reading because of irregularities in preparation, for example, smoking by the patient prior to the test. The heart rate was 72 per minute on August 20.

Dr. Penington explained that his reason for demonstrating the patient was to point out that in any case in which there was an inadequate explanation for auricular fibrillation, it was necessary to exclude thyreotoxicosis. He also mentioned that in the present instance, although medical treatment had been commenced, surgical intervention would be necessary if the progress was not entirely satisfactory.

#### **Gastric Ulcer.**

DR. IAN WOOD AND DR. P. PARSONS showed two patients suffering from chronic gastric ulcer who had suffered considerable loss of weight following the taking of an inadequate diet. When first seen they were in poor physical condition and it would have been most hazardous to undertake subtotal gastrectomy. A diet with a high caloric, high vitamin content had been instituted with gratifying results. In order to maintain a high caloric intake, nutritious supplementary drinks were administered during the evening and sometimes in the middle of the night. When operation for subtotal gastrectomy was subsequently carried out by Dr. Julian Smith, the patients withstood the operation well and the post-operative course was satisfactory.

#### **Chronic Hepatitis.**

The next patient shown by Dr. Wood and Dr. Parsons was a male, aged forty-seven years, with chronic hepatitis probably due to the virus of infectious hepatitis. The onset of the attack had been severe with drowsiness, enlarged liver, jaundice and ascites. The biochemical test results were classical for the disease and included a positive result to the cephalin flocculation test, high serum bilirubin content and inversion of the albumin:globulin ratio. Aspiration biopsy showed the typical changes of severe hepatitis. Recovery appeared to be taking place after a chronic illness lasting nine months.

#### **Alcoholic Hepatitis.**

The third patient of Dr. Wood and Dr. Parsons was a male, aged fifty-six years, who for the previous nine years had been subject to lapses lasting several months when he had consumed large quantities of alcohol and taken very little food. That had resulted in an enlarged tender liver and impairment of liver function. Liver biopsy, by means of the needle technique, showed gross fatty infiltration of the liver cells. A diet rich in methionine was instituted and the patient refrained from taking alcohol. After six months of that régime he was apparently restored to health, the liver function test results were normal and liver biopsy showed that the fatty infiltration of liver cells had practically disappeared.

#### **Hypochromic Anæmia.**

Dr. Wood and Dr. Parsons then showed a male patient, aged sixty-five years, who had suffered for the previous six months from increasing dyspnoea and precordial pain on exertion; the heart was enlarged, the blood pressure 240 millimetres of mercury (systolic) and 120 millimetres (diastolic), the radial arteries were thickened and the urine contained one-quarter albumin. For the previous three months he had been taking a most inadequate diet in an attempt to reduce his blood pressure. Examination of the blood showed marked hypochromic anæmia, the hæmoglobin value being 48%. It was then discovered that he had been losing a considerable amount of blood from prolapsed hæmorrhoids. Treatment consisted of a high caloric diet, iron therapy and local treatment of the hæmorrhoids. In two months the hæmoglobin value rose from 48% to 80%, and the patient's general health and exercise tolerance greatly improved. The patient was shown to illustrate the ill effects of anæmia on an already impaired cardio-vascular system, and the benefit achieved by recognizing and treating the anæmia.

#### **Gastric Motility.**

Dr. Parsons demonstrated the apparatus used for studying gastric motility. When insulin was injected intravenously there was a fall of blood sugar and vigorous contractions occurred in the stomach. These were silenced by the administration of atropine. Studies were made of cases of peptic ulcer in which the treatment consisted of cutting both vagus nerves in the thorax. After vagotomy insulin failed to promote vigorous peristalsis.

#### **Sarcoidosis.**

DR. BRUCE ROBINSON presented four patients with sarcoidosis selected from a series he was investigating at the hospital in conjunction with members of the staff of the Pathology Department, University of Melbourne, and



the Walter and Eliza Hall Institute. All diagnoses had been proved by biopsy.

His first patient, a woman, aged fifty-four years, had had the condition for fifteen years and had lesions of the skin, phalanges, lymph glands and lungs. The skin lesions were gross. There were the large purple areas of Besnier's *lupus pernio* on both cheeks. Similar lesions on the fingers and toes were superimposed on the typical bony changes described by Jungling as *osteitis tuberculosa multiplex cystica*. Other skin lesions on the arm more closely approximated the sarcoid described by Boeck. Pulmonary involvement had probably commenced eight years previously when she had malaise, cough and loss of weight. Those symptoms had disappeared, but the X-ray film still showed widespread infiltration. Recently an enlarged rubbery cervical lymph gland had been discovered. Eight months before the meeting she developed glaucoma of the left eye, which was probably not related to the other lesions. The patient showed the expected negative results to the Wassermann and Mantoux tests. The serum protein levels were raised with reversal of the albumin:globulin ratio. Her only remaining complaint was of the disfigurement caused and that had become less obvious while she was taking calciferol.

Dr. Robinson's next patient was a woman, aged fifty-four years, with skin lesions of both types which had been present for five years. There were large chilblain-like areas on both hands and fingers, but X-ray examination of the bones and lungs had revealed no abnormality. Fading sarcoids were present on the arm and forehead. Enlarged lymph glands had been present, but they had become impalpable following deep X-ray therapy. The total serum protein level was raised, but the albumin:globulin ratio was undisturbed. The results of Wassermann and Mantoux tests were negative. A slight eosinophilia was present as had been found in a significant number of members of the series.

The third patient, a woman, aged fifty-five years, was presented to show healed skin and lung lesions. Sarcoids had appeared in 1944, but had then been replaced by many atrophic scars. In 1943 she had become short of breath, but clinically no cause was found. In 1944 she had developed a cough, lost weight and felt ill, and an X-ray examination revealed a widespread infiltration throughout the lungs. That had cleared slowly. Dr. Robinson remarked that the disease was one of many signs but few symptoms. In the patients he had under observation symptoms were most common in the early months of pulmonary involvement. They were cough with sputum, loss of weight, malaise and febrile attacks. He said that the patient being discussed had also been taking calciferol during the stage of resolution, but it was impossible to draw conclusions from small numbers in a disease that waxed and waned as did that one. The patient also showed eosinophilia, a raised total serum protein level with inversion of the albumin:globulin ratio and the expected negative result to the Wassermann test. The result of a Mantoux test, however, was positive.

Dr. Robinson's last patient was a man, aged forty-four years. Four years previously he had developed left facial paralysis and left iridocyclitis. Some months later there was a right-sided palsy and slight involvement of the right eye. Although there was no history of involvement of the parotid glands it seemed that the condition was an example of the *uveo-parotid fever* of Heerfordt. Four years previously there had been cough, malaise and loss of weight and the X-ray films of the chest had suggested sarcoidosis. That was confirmed by lymph gland biopsy. All the lesions were inactive at the time of the meeting. The serum protein values and the results of a Wassermann test and of blood examinations were normal, but the Mantoux reaction was "positive" to human and bovine strains.

Dr. Robinson concluded his demonstration by explaining the work done by his colleagues in the investigation of the aetiology of the disease. With regard to treatment, he said that deep X-ray therapy rendered the glands impalpable, but no other treatment appeared specific, though he intended to try calciferol on others of his patients.

Dr. H. G. HILLER assisted by showing microscopic sections of lesions from various organs demonstrating the same underlying lesion for all manifestations of the syndrome as was first shown by Schaumann in 1914.

#### Surgical Problems.

Dr. A. E. COATES presented patients illustrating three surgical problems: (i) arterio-venous communications of congenital origin, (ii) the place of surgery in ulcerative colitis, and (iii) the surgical treatment of intractable pain of vascular origin.

#### Arterio-Venous Communications.

The first problem was illustrated by a girl, aged seventeen years, who had been admitted to hospital with spontaneous hæmorrhage from telangiectases of the right arm. There was a pinkish purple discoloured area corresponding to the nerve distribution of the fourth and fifth cervical segments. A palpable thrill and a machinery murmur were present in the right posterior triangle of the neck and also over the deltoid area. The discoloured part was warm and pulsatile. Excision of the tortuous vessels in the lower part of the arm had been followed by further bleeding from areas over the deltoid muscle. Excision of a tortuous mass of vessels in the posterior triangle was then carried out. Bleeding occurred from the breakdown of more telangiectatic spots and then the right subclavian artery was injected with thorotrast. X-ray examination disclosed a large aneurysmal swelling in the right axilla, and also a mass of dilated nerves communicating with the swelling. Excision of the arterio-venous mass in the axilla was performed. Further excision of the mass of vessels over the deltoid was carried out, but the wound did not heal, and leakage of bright blood necessitated several transfusions. A large hæmorrhage one day was arrested by ligation of the innominate artery. The common carotid artery was spared. Still the shoulder wound did not heal, and two months later further hæmorrhage occurred. It was decided that radical treatment short of amputation was necessary. Excision of the whole deltoid region including some muscle was carried out and the bare area was covered by swinging the breast over the shoulder. Good healing then occurred, except for a small patch which was covered by pinch grafts, all of which "took" well. It was considered that a plastic operation would be necessary later to restore the normal configuration.

The second patient shown by Dr. Coates was a woman, aged thirty years, who had suffered a fall on the head eleven years previously; a circoid aneurysm of the left side of the scalp developed. Dr. Coates had treated it by ligation of the external carotid and the superficial temporal arteries in 1937. The condition was apparently cured for nine years, but a recurrence of the tortuous mass induced the patient to seek further treatment. Three months before the meeting the mass of vessels had been excised. A coronal flap was turned up and the vessels (many of which were as large as a fountain pen) were dissected off the scalp-flap. Diathermy was used extensively. Since operation there was no sign of recurrence. The lesson was that radical excision was the only treatment of massive arterio-venous collections.

#### Surgery in Ulcerative Colitis.

The second series presented by Dr. Coates illustrated the place of surgery in ulcerative colitis. The first patient was a male, aged twenty-three years, who had been treated since childhood for ulcerative colitis. In February, 1946, an ileostomy had been performed. He gained two stone in weight, but continued to discharge blood and pus *per anum*. In March, 1947, colectomy was performed. The ileostomy opening was excised and the wound enlarged so that the lower foot of ileum and the whole colon could be removed *en bloc*. Ileo-rectal anastomosis was carried out. It was found that there was a large fungating carcinoma of the transverse colon. The patient had rapidly improved, but suffered a relapse of diarrhoea two months before the meeting (six months a day). The tongue was smooth and shiny. Accordingly "Niacin" and sulphaguanidine had been administered for two weeks. Immediate relief was obtained, and at the time of the meeting he was passing a normal soft stool twice a day.

The next patient, a woman, aged forty years, had been referred to Dr. Coates nine years before for operation for ulcerative colitis, and had undergone ileostomy. After one year colectomy was performed. As the rectum was still extensively ulcerated at that time it was thought unwise to anastomose the ileum to the rectum. The ileostomy had continued to function well. The discharge was semi-solid (like tooth paste), and the patient had led a comfortable existence doing normal housework. Three weeks before the meeting a flare-up of the rectal ulceration had caused her to seek help. Proctoscopic examination revealed many superficial ulcers of the rectum. They were being treated with silver nitrate and flavine washouts, with great relief. It was proposed to leave her with her rectum.

Dr. Coates then showed a girl, aged twenty years, treated for a long period medically for ulcerative colitis, and referred by Dr. L. E. Hurley; she had had an ileostomy performed four months prior to the meeting. She had since gained four stone in weight, looked very well and was awaiting colectomy. As her rectum was clear it was proposed to perform an anastomosis as in the previous case. Dr. Coates said that it was to be noted that "ileostomy life" was as comfortable

as "colostomy life". Proper care of the skin prevented excoriation and there had been no complications (such as fistulae or prolapse obstruction). The small bowel took over the function of water absorption, so that the discharge was not liquid as it was in a normal person.

#### *Surgical Treatment for Relief of Pain.*

The third series presented by Dr. Coates illustrated the place of surgery in the relief of pain, but not necessarily for the complete cure of the disease.

The first patient was a woman, aged seventy-seven years, who had sought advice for severe intolerable pain in the right shoulder, caused by a parosteal sarcoma of the right humerus. Drugs failed to relieve the pain. The chest was normal radiologically. Three months before the meeting intercapulothoracic amputation had been performed, followed by an uneventful convalescence and complete relief of pain.

The second patient was a woman, aged fifty years, who had been referred by Dr. L. E. Hurley with pain in the left foot which was unrelieved by medical measures. Ulceration of the dorsum of the toes caused intense pain. The pulse in the tibial arteries and in the *dorsalis pedis* artery was absent. Colour changes in the foot were reminiscent of Buerger's disease. She had arteriosclerosis. The tibial nerve and the sural, saphenous and superficial peroneal nerves were divided through small incisions under local anaesthesia above and about the ankle region. No trophic changes occurred as they usually did when nerves were divided close to the cord. Relief of pain was immediate, though inflammatory reactions produced the usual slight pain in the ulcerated areas, which were anaesthetic.

#### *Fragilitas Ossium.*

Dr. T. H. ACKLAND showed a male patient, aged thirty years, who had sustained forty fractures, although none had occurred in the previous five years. His father had had twenty fractures, one brother fourteen, one sister seven, another sister eight, and another five. However, one brother was free from the disease. The patient had one child who had had one fracture at the age of six months. Typical blue sclerotics were present.

#### *Tabes Dorsalis with Perforating Ulcers of the Feet.*

Dr. Ackland's second patient was a male, aged forty-five years, who had had the typical signs of *tabes dorsalis* when he first attended the hospital in 1945 because of chronic ulcers under the ball of each great toe. They were typical perforating ulcers, surrounded by much heaped-up epithelium, and quite painless. After several courses of antisyphilitic treatment the ulcer on the left foot had almost healed, but there had been less improvement on the right side.

#### *Spina Bifida Occulta: Pes Cavus: Perforating Ulcer of the Left Foot.*

Dr. Ackland then showed a female, aged nineteen years, who had had a history of ulceration beneath the ball of the left hallux for two years. It was not painful, and the patient was able to walk and dance as usual. Palpation of the lumbar part of the spine revealed a gross bony defect covered by skin with excessive and rather lumpy subcutaneous fat, but without pronounced hirsuties. X-ray examination showed wide defects in the arches of the third, fourth and fifth lumbar vertebrae and a smaller defect of the first sacral segment. There was also bony erosion of the head of the first metatarsal bone corresponding to the base of the perforating ulcer. Knee jerks and ankle jerks were absent and *pes cavus* of second degree was present on both sides. Dr. Ackland stated that the cause of the onset of symptoms in such cases was not always clear. A fibrous cord passing from the subcutaneous tissue through the bony defect to be attached to the end of the spinal cord had been described in some patients, and from that point of view it was considered advisable to subject this patient to exploratory operation.

#### *Perforating Ulcer of the Foot of Uncertain Cause.*

The fourth patient shown by Dr. Ackland was a male, aged forty-four years, who had dropped a heavy weight on his foot eight months previously; a few weeks thereafter a deeply perforating ulcer had developed on the plantar aspect of the proximal phalanx of the left great toe. It now had the same appearance as the ulcers referred to in the previous two cases; it was painless, and penetrated, not into the joint, but to an area of osteomyelitis in the proximal phalanx through which there was a pathological fracture. Examination of the central nervous system revealed no

abnormality. There was no sugar in the urine, and the results of Wassermann and Kahn tests were negative. Examination of the cerebro-spinal fluid also revealed no abnormality. It was found, however, that superficial sensation was absent along the plantar aspect of the great toe and ball of the foot, and that there was diminution in appreciation of position and passive movement in both great toes. Dr. Graeme Robertson had suggested that the most likely cause of the rather unusual perforating ulcer was that the injury had affected the medial plantar nerve, causing a strictly local loss of sensation. Dr. Ackland pointed out that division of peripheral nerves was usually followed by beneficial results in the case of varicose ulcers, and it was difficult to understand why, in that case, the reverse effect should be seen.

#### *Fatty Hernia of the Linea Alba.*

The next patient was a male, aged eighteen years, who had suffered from rather vague and atypical dyspepsia for several months. It was found that he had a fatty hernia of the *linea alba*. Dr. Ackland drew attention to the fact that those herniae might cause reflex dyspepsia and, if the patient was at all obese, the small herniation which usually contained fat or the round ligament only, and no sac, might easily be overlooked.

#### *Ureteric Calculi.*

Dr. Ackland then presented a female patient, aged twenty-five years, who had had a history of left renal colic for eighteen months; X-ray examination revealed two calculi in the lower part of the left ureter at the level of the ischial spine. The largest was one and a half inches in length and nearly half an inch in width. While waiting in hospital for operation the patient had a severe bout of colic and both stones were passed. It was then found by excretion pyelography that a moderate-sized left hydronephrosis was present. Further examination of the kidney two months later showed decrease in size of the hydronephrosis.

#### *Paget's Disease.*

The next patient, a male, aged sixty-three years, had complained for eighteen months of pain below the right knee joint. It was found that both tibiae were enlarged and bowed forward and outwards. Radiological examination had confirmed the diagnosis of Paget's disease in the upper portions of both tibiae. Dr. Ackland stated that he had found deep X-ray therapy of use in controlling the aching pain associated with the disease.

Dr. R. HADLEY drew attention to the fact that excessively pronounced temporal ridges could be felt on the patient's head, and that that was an early sign of Paget's disease involving the skull.

#### *Parotid Swellings of Uncertain Cause.*

Dr. Ackland's last patient was a female, aged forty-three years, who had complained of swellings behind the angle of the mandible for twelve years. She thought the lumps varied in size from time to time and there was pain occasionally. Examination revealed hard mobile enlargements of both parotid glands. There was no enlargement of the lacrimal or submaxillary glands, such as usually accompanied the parotid swellings in Mikulicz's disease, and a diagnosis of sialectasis was possible. Sialograms would be made to investigate that possibility. Dr. Ackland said that in Mikulicz's disease there was an infiltration with small round cells of the glands previously referred to, but the cause was unknown. A biopsy would also be carried out if there was no sialectasis.

(To be continued.)

## Special Correspondence.

### PARIS LETTER.

#### FROM OUR SPECIAL CORRESPONDENT.

It is with real pride that, as new correspondent to THE MEDICAL JOURNAL OF AUSTRALIA, I write my first letter from Paris. In the first place, I should like to express my heartfelt thanks to Dr. T. W. Lipscomb who asked me to be your medical friend, and likewise to the Editor for the confidence he has placed in me.

I should like to give you as often as possible an idea of the medical happenings in my country and, though an ear, nose and throat specialist, I shall try to show you all the aspects of medical science over here.

To begin with, let us look back for a short while, that is before the last war when medical science was as a matter of fact world-wide; no borders of any kind existed between countries; scientific news was conveyed easily and everything was simple. Then French medicine was not in tow of anyone.

In June, 1940, the German occupation took place, the curtain dropped, and for four years medical men in this country had but slender means and practically no liberty to maintain the people's health and to carry on with medical research. But during that period, fortunately, a great deal of work was done by the doctors of the United States of America, Great Britain and everywhere in the British Commonwealth; so that, conscious of being behind the times, we were seized with a fever for learning and since 1945 hundreds of French surgeons have flown to America to acquire these new surgical techniques.

On the other hand, many medical congresses have been held in Europe, especially in London and Paris. To all of us, who were less fortunate and could not go so far over the water, an opportunity has been given to brush up our knowledge on every subject which interested us individually.

To refer only to the last meetings held in Paris two will be mentioned. (i) The first is the meeting of the General Assembly of the World Medical Association. No doubt you have already in hand the reports on the matters discussed last September in Paris. The British Medical Association in Australia is a member of the World Medical Association. (ii) The second is the meeting of the *Société française d'oto-rhino-laryngologie*. At this meeting lengthy reports were given concerning the results already achieved in the fenestration of the labyrinth (Lempert operation). There is no need to emphasize the interest created in that subject both in the medical profession and among lay people. I intend in one of my future letters to give some particulars of the fifty cases in which this operation has been performed by my friend and colleague Dr. Jean Salomon and myself during the last twelve months, since Dr. Salomon came back from the United States of America.

## Nominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Delthe, Noel Harold Ross, provisional registration, 1947 (Univ. Sydney), 181, Prince Street, Orange, New South Wales.

Gray, Ronald Wallace Menzies, M.B., B.S., 1944 (Univ. Sydney), 75, Woniara Road, Hurstville.

## Corrigendum.

A LETTER has been received from Macmillan and Company, Limited, publishers, of London, to the effect that the price of the two volumes of "Human Genetics", by R. Ruggles Gates, reviewed in this journal on August 16, 1947, was erroneously stated by them as being £5. The price of the two volumes is £3 15s. sterling net.

## Books Received.

"The 1947 Year Book of the Eye, Ear, Nose and Throat." The Eye, edited by Louis Bothman, M.D.; The Ear, Nose and Throat, edited by Samuel J. Crowe, M.D., with the collaboration of Elmer W. Hagens, M.D.; 1947. Chicago: The Year Book Publishers, Incorporated. 7" x 4½", pp. 488, with many illustrations. Price: \$3.75.

"Endogeneous Endocrinotherapy, including the Causal Cure of Cancer Compendium", by Jules Samuels; 1947. Amsterdam: Holdert and Company. 9½" x 6½", pp. 546, with illustrations.

"The Occasion Fleeting", by Hugh Barber; 1947. London: H. K. Lewis and Company, Limited. 8½" x 5½", pp. 208. Price: 15s.

"A Short Textbook of Surgery", by C. F. W. Illingworth, C.B.E., M.D., Ch.M., F.R.C.S. (Edinburgh); Fourth Edition; 1947. London: J. and A. Churchill Limited. 9½" x 6", pp. 688, with many illustrations. Price: 30s.

"Recent Advances in Sex and Reproductive Physiology", by J. M. Robson, M.D., D.Sc. (Leeds), F.R.S.E., with an Introduction by Professor F. A. E. Crew, M.D., D.Sc., F.R.S.; Third Edition; 1947. London: J. and A. Churchill Limited. 8" x 5½", pp. 348, with many illustrations. Price: 21s.

## Diary for the Month.

JAN. 7.—Western Australian Branch, B.M.A.: Council Meeting.

JAN. 9.—Queensland Branch, B.M.A.: Council Meeting.

JAN. 15.—Victorian Branch, B.M.A.: Organization Subcommittee.

JAN. 19.—Victorian Branch, B.M.A.: Finance, House and Library Subcommittee Meeting.

JAN. 22.—Victorian Branch, B.M.A.: Executive Meeting.

JAN. 23.—Queensland Branch, B.M.A.: Council Meeting.

JAN. 28.—Victorian Branch, B.M.A.: Council Meeting.

## Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

**New South Wales Branch** (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmmain United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phoenix Mutual Provident Society.

**Victorian Branch** (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

**Queensland Branch** (Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute; Brisbane City Council (Medical Officer of Health). Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

**South Australian Branch** (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

**Western Australian Branch** (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

## Editorial Notices.

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